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WIND TUNNEL TEST ON A 1/4.622 FROUDE SCALE, HINGELESS ROTOR, TILT ROTOR MODEL

VOLUME III

J. P. Magee

H. R. Alexander

September 1976

Prepared under Contract NAS2-9015

for

National Aeronautics and Space Administration

Ames Research Center

by

BOEING VERTOL COMPANY
A DIVISION OF THE BOEING COMPANY
P O BOX 16858
PHILADELPHIA, PENNSYLVANIA 19142

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A DIVISION OF THE BOEING COMPANY
P.O. BOX 16858
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REVISIONS			
LTR	DESCRIPTION	DATE	APPROVAL

ABSTRACT

This document is Volume III of four volumes of experimental data obtained on a wind tunnel test of a 1/4.62 Froude scale hingeless rotor tilt rotor model. The test generated parametric data from hover, through transition and out to 300 knots full scale speed in cruise, and was performed under NASA Contract NAS2-9015.

This volume contains transition data files.

FOREWORD

This report was prepared by the Boeing Vertol Company of Philadelphia, Pennsylvania for the National Aeronautics and Space Administration, Ames Research Center under NASA Contract NAS2-9015.

Mr. M. A. Shovlin and Mr. T. Galloway of Ames Research Center were technical monitors for this work.

The Boeing Program Manager was Mr. J. P. Magee. The contributions of the Boeing Vertol Wind Tunnel staff are acknowledged.

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LIST OF SYMBOLS

SYMBOL	NOMENCLATURE	UNITS
A_1	Lateral cyclic pitch	Deg
B_1	Longitudinal cyclic pitch	Deg
b	Span	Ft
CTB-L	Left Rotor Thrust Coefficient	$\frac{T_L}{\rho \pi R^2 V_T^2}$
CPB-L	Left Rotor Power Coefficient	$\frac{HP_L \times 550}{\rho \pi R^2 V_T^3}$
CNFB-L	Left Rotor Normal Force Coefficient	$\frac{NF_L}{\rho \pi R^2 V_T^2}$
CSFB-L	Left Rotor Side Force Coefficient	$\frac{SF_L}{\rho \pi R^2 V_T^2}$
CPMB-L	Left Rotor Pitching Moment	$\frac{PM_L}{\rho \pi R^3 V_T^2}$
CYMB-L	Left Rotor Yawing Moment	$\frac{YM_L}{\rho \pi R^3 V_T^2}$
CTB-R	Right Rotor Thrust Coefficient	$\frac{T_R}{\rho \pi R^2 V_T^2}$
CPB-R	Right Rotor Power Coefficient	$\frac{HP_L \times 550}{\rho \pi R^2 V_T^3}$
CNFB-R	Right Rotor Normal Force Coefficient	$\frac{NF_R}{\rho \pi R^2 V_T^2}$
CSFB-R	Right Rotor Side Force Coefficient	$\frac{SF_R}{\rho \pi R^2 V_T^2}$
CPMB-R	Right Rotor Pitching Moment	$\frac{PM_R}{\rho \pi R^3 V_T^2}$

LIST OF SYMBOLS (continued)

SYMBOL	NOMENCLATURE	UNITS
CYMB-R	Right Rotor Yawing Moment	$\frac{YM_R}{\rho\pi R^3 V_T^2}$
CLW-AC	Aircraft Lift Coefficient	$\frac{\text{Lift}}{1/2\rho V^2 S}$
CSFW-AC	Aircraft Side Force Coefficient	$\frac{SF}{1/2\rho V^2 S}$
CAFN-AC	Aircraft Axial Force Coefficient	$\frac{\text{Axial Force}}{1/2\rho V^2 S}$
CPMW-AC	Aircraft Pitching Moment	$\frac{\text{Pitch Moment}}{1/2\rho V^2 S\bar{c}}$
CYMW-AC	Aircraft Yawing Moment	$\frac{\text{Yaw Moment}}{1/2\rho V^2 Sb}$
CRMW-AC	Aircraft Rolling Moment	$\frac{\text{Roll Moment}}{1/2\rho V^2 Sb}$
$\bar{c}$	Wing Chord	FT
D	Diameter	-
D'	Airframe Drag	LB
EI_{FLAP}	Flapwise Bending Stiffness	-
EI_{CHORD}	Chordwise Bending Stiffness	-
FM	Figure of Merit	-
GJ	Torsional Stiffness	-
GW	Gross Weight	LB
HP	Rotor Horsepower	HP
I_{xx}, I_{yy}, I_{zz}	Mass Moment of Inertia about the Three Axes	IN-LB SEC^2
I_N	Nacelle Incidence	Deg
I_p	Acceleration Pitch Inertia	-
H_Z	Hertz	-

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
I^*_p	Centrifugal Pitch Inertia	-
I_{PIVOT}	Moment of Inertia - Polar	LB-FT
i_w	Wing Incidence	Deg
L	Lift	LB
NA	Neutral Axis	-
p	Per Rotor Revolution	-
PM	Pitching Moment	FT LB
q	Freestream Dynamic Pressure $1/2\rho V^2$	LB/FT^2
R	Rotor Radius	FT
r	Radial Location to a Blade Station	FT
RM	Rolling Moment	FT LB
S	Wing Area	FT^2
SF	Side Force	LB
T	Rotor Thrust	LB
t	Airfoil Thickness	FT
V	Freestream Velocity	FT/SEC
V_T	Rotor Tip Speed	FT/SEC
X	Aircraft Propulsive Force	LB
X/R or r/R	Non-Dimensional Radius	-
YM	Yawing Moment	FT LB
α	Angle of Attack	-
α_f	Fuselage Pitch Deflection	Deg
α_s	Nacelle Shaft Pitch Deflection	Deg

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
β	Side Slip Angle	Deg
δ_A	Aileron Deflection	Deg
δ_F	Flap Deflection	Deg
∂	Partial Derivative Operator	-
Δ	Increment In Coefficient	-
$\Delta\theta$	Incremental Blade Pitch	-
ρ	Density of Air	LB SEC^2/FT^4
σ	Rotor Solidity $\frac{bcR}{\pi R^2}$	-
ψ	Rotor Azimuth Angle	Deg
θ_{75}	Rotor Blade Collective Pitch at the Three Quarter Radius	Deg
μ	Advance Ratio V/V_T	-
ω_α	Wing Torsional Frequency	cps
ω_β	2nd Mode Bending Blade Frequency	-
ω_c	Wing Chordwise Bending Frequency	cps
ω_L	1st Mode Bending Blade Frequency	-
ω_p	Aircraft Pitch Frequency	cps
ω_v	Wing Vertical Bending Frequency	cps
Ω	Rotor Angular Velocity	-
$1\Omega, 2\Omega$	Integer Frequency Ratio	-
$\Omega-\omega\ell$	Lower Blade Lag Rotational Frequency	cps
$\Omega+\omega\beta$	Upper Blade Flap Rotational Frequency	cps
$\Omega-\omega\beta$	Lower Blade Flap Rotational Frequency	cps

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
ζ_V	Wing Vertical Bending Damping % Critical	-
ζ_C	Wing Chord Bending Damping % Critical	-
ζ_α	Wing Torsion Damping % Critical	-

1.0 INTRODUCTION

This document contains wind tunnel test data obtained on a 1/4.622 scale dynamically similar model of a tilt rotor aircraft which has composite hingeless blades. The test was performed under NASA contract NAS2-9015.

The objective of the test was to generate information on the behavior of rotor and airframe effects over a range of flight parameters representing the complete operating envelope of the tilt rotor vehicle. The information which was required included the magnitude and sensitivity of:

(1) Rotor forces and moments

(2) Blade loads and pitch link loads

(3) Wing rotor interference effects

(4) Airframe forces and moment

for values of such flight parameters as:

(1) Nacelle tilt angle

(2) Forward speed

(3) Aircraft attitude in pitch and yaw

(4) Collective and cyclic pitch control

(5) Wing flap deflection

The selection of test points and true variations for parameters was made in such a way that a comprehensive set of data was obtained for all potential flight conditions through hover, a wide envelope of transitions, and cruise at speeds up to 300 knots.

The purpose of this acquisition of comprehensive rotor and airframe test data is to provide the knowledge and basis for understanding rotor and airframe behavior which is an essential prerequisite to the development of an efficient system of integrated rotor and aircraft controls.

A secondary objective of the test was to determine the feasibility of a control system which minimizes blade loads in cruise. The characteristic feature of this system is the use of cyclic pitch geared by a simple mechanical linkage to the motion of the stick and control surfaces. These must be properly phased and scheduled to achieve good flying qualities in all flight regimes, subject to the overall design requirement of an optimal control system to maintain simplicity and reliability as far as is consistent with the loads, maneuver envelope and flying qualities of the aircraft.

The rotor controls provide a major portion of the control capability from hover through the low transition speed range, although the conventional control surfaces are operative in all regimes of flight including hover. As speed is increased, and the aerodynamic surfaces become effective for trim and control, the rotor controls can be directed at minimizing rotor loads. In cruise the problem reduces to determining the rotor control required to maintain minimum loads. Prior to this test, a limited amount of full scale experimental data existed for transition, and for cruise up to speeds of 192

knots. This test program extends the range of this data in the transition regime, and in cruise flight the range was extended up to the simulated speed of 300 knots.

The data obtained on this test goes a long way toward providing the information which is necessary to tackle the job of designing an optimized and integrated control system for a tilt rotor aircraft using a soft inplane hingeless rotor. Work which remains to be done involves reducing the data obtained in the test, to an analytical format with forces, moments, loads, etc., expressed as functions of the relevant flight parameters. This is necessary for two reasons:

(1) to provide an understanding of the significance and relative importance of the parameters which will permit efficient planning of future full scale tests

(2) to provide a set of simple functions representing the body of test data, from which the rotor effects may be calculated within the context of a real time simulation

This reduction of the test data to analytical functions of the parameters is beyond the scope of the current contract. It is planned that this additional step will be accomplished in the near future under separate funding.

The data obtained during this test is presented in four volumes.

Volume I contains a detailed description of the model, the test installation, test procedures and data reduction: for the convenience of the user, an abbreviated discussion of these is included in Volumes II, III and IV. It was felt that the amount of data generated was too voluminous to be readily presented in a single volume, and Volumes II, III and IV present all the data in a logical sequence.

2.0 DESCRIPTION OF MODEL AND DATA FILE SYSTEM

This section of the report contains an abbreviated description of the model and also an explanation of the order in which the data are presented and identifies the values of test variables held constant in any given test run.

2.1 Model Description

The model tested is a 1/4.622 scale full span, powered configuration that is Froude scaled from the Model 222 Tilt Rotor Research aircraft. This model, shown in Figure 1 was provided by the contractor for this test program and has the following major dynamically-scaled components.

1. Two 3-bladed rotors
2. Two nacelles
3. Full span wing
4. Fuselage
5. Tail

Basic model dimensions are shown in Table 1. The rotors are defined in Figure 2 and have the same aerodynamic and aeroelastic characteristics as the full scale rotor built under NASA contract NAS2-6505. It has remote controlled collective pitch and two axes cyclic pitch actuation systems.

The nacelles are joined to the wing by a pivot and have remote pitch actuation.

TABLE 1

MODEL DIMENSIONS

ROTOR

Number of Blades	3
Radius	33.75 IN. (85.72 cm)
Chord	4.078 IN. (10.35 cm)
Twist	42.5 DEG.
Airfoil Section	23021/23010-1.58
Solidity	0.115
Rotor Speed (Hover)	1185 RPM
Rotor Speed (Cruise)	825 RPM
Collective Pitch Available	-5 to 65 DEG.
Cyclic Pitch Available	± 10 DEG.

NACELLE

Nacelle Pivot Position (in % of Wing Chord)	40%
Rotor Disc Nacelle Pivot Distance	12.33 IN. (31.31 cm)

WING

Airfoil Section	63_4221 Modified
Span (Rotor ℄ to Rotor ℄)	86.76 IN. (220.37 cm)
chord	15.53 IN. (39.44 cm)
Area	9.36 FT.^{2} (.869 M^2)
Aspect Ratio	5.61
Flap in % of Chord	30%
Wing Incidence	2 DEG.
Thickness - Chord Ratio	0.21

FUSELAGE

Diameter	14.69 IN. (37.31 cm)
Length	102.50 IN. (260.35 cm)

TAIL - HORIZONTAL

Area	2.73 FT.^{2} (.253 M^2)
Span	10.89 IN. (27.66 cm)
Aspect Ratio	4.25
Taper Ratio (C_{TIP}/C_{ROOT})	.384
Root Chord	14.05 IN. (35.68 cm)
Airfoil Section	64A010
Elevators in % of Chord	44.1%

TABLE 1 (continued)

TAIL - VERTICAL

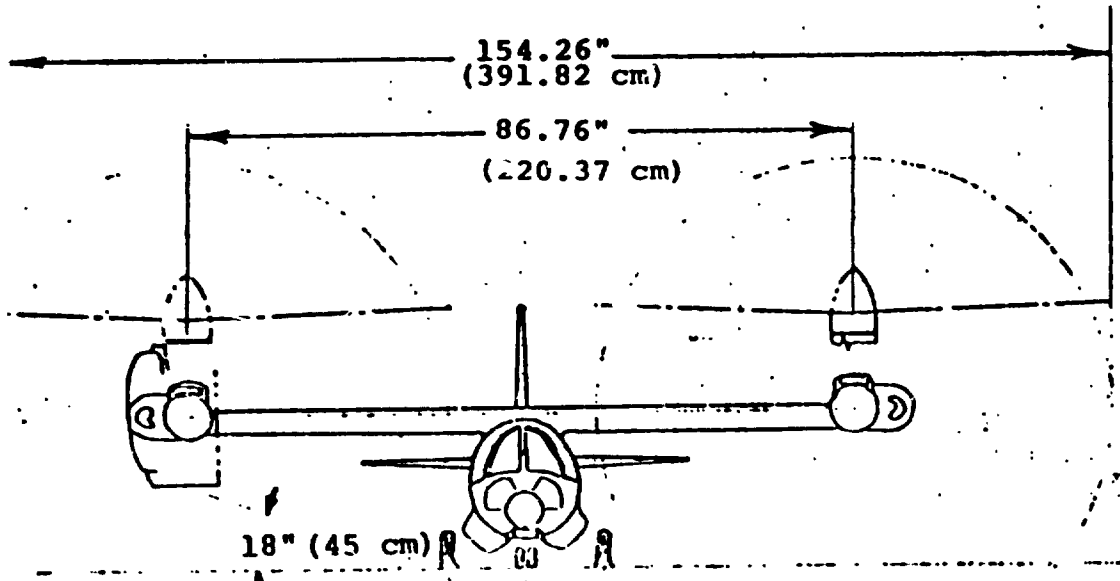
Area	2.03 FT^2	(.185 M^2)
Span	22.75 IN.	(57.78 cm)
Aspect Ratio	1.77	
Taper Ratio (C_{TIP}/C_{ROOT})	.35	
Root Chord	20.98 IN.	(58.29 cm)
Airfoil Section	64A008	
Rudder in % of Chord	50.6	

ROTOR

Diameter	67.50 In. (171.45 cm)
Solidity	.115
No. Blades	3

WEIGHTS

Design Gross Wt 122 Lbs (55.35 Kg)



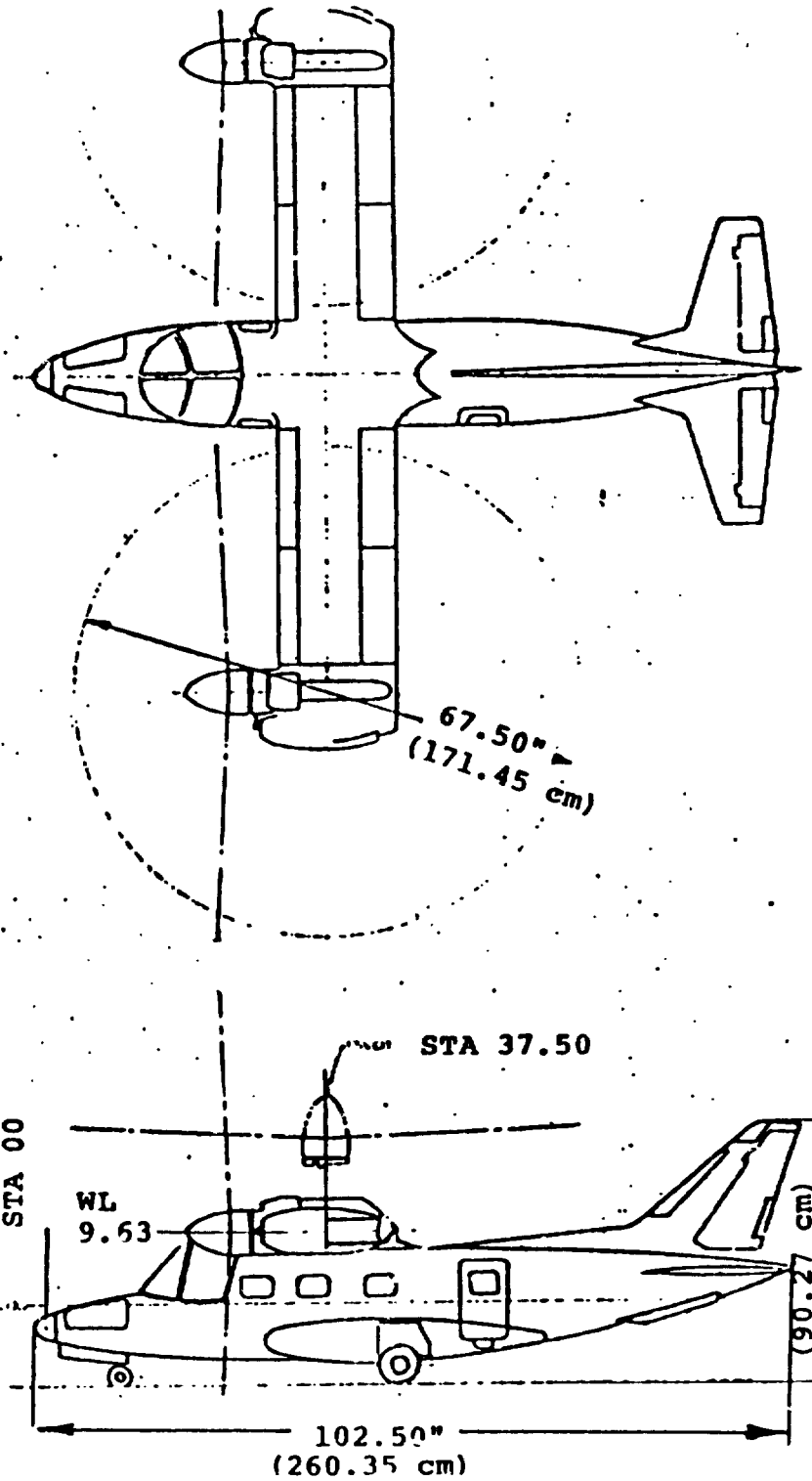


FIGURE 1 1/4 SCALE MODEL ALL AND CANNARD MODEL.

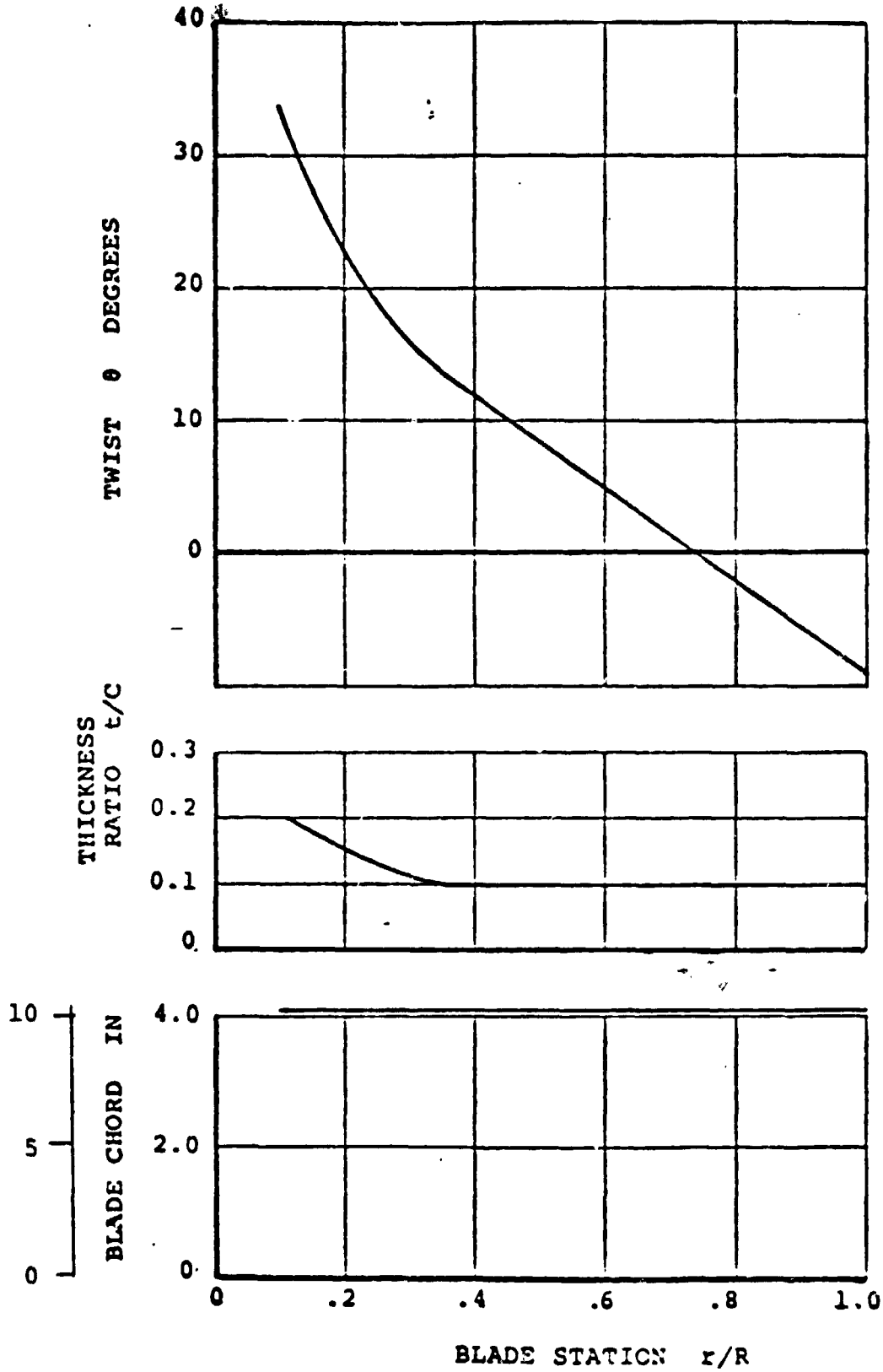


FIGURE 2. 1/4.622 FROUDE SCALE MODEL BLADE DEFINITION

The wing is crown mounted and has full span flaps and leading edge umbrellas for download alleviation. Flaps are used during transition to provide additional lift and the outboard section of the flap is used as an aileron for control in conjunction with outboard spoilers.

The wing, fuselage, and empennage are dynamically scaled from the Model 222 aircraft and the rudder and elevator are remotely controlled. The model was supported on a pedestal mount with pitch and yaw capability.

The primary instrumentation includes strain gages to obtain flap, chord and torsion loads at the blade root. A six component balance in each nacelle measures the rotor forces moments and torque. A six component main balance located in the fuselage measures aircraft forces and moments. Position indicators connected to meters provide a visual display of the aircraft control positions which were remotely controlled. Each rotor has an RPM and 1/rev output. Thermocouple readouts provided safety monitoring of critical motor, gearbox and cross shaft bearing temperatures.

The model is powered by a 20 HP, 11,375 RPM electric motor manufactured by Task Corporation. The motor drives a 3.04:1 reduction gear box in the center fuselage which is connected by cross shafts in the wing to a 3.09:1 reduction gear box in each nacelle. This provides a total gear reduction from the electric motor to rotor of 9.39:1.

Photographs of the model and detailed model data are provided in Volume I Reference .

Figure 3 shows the model mounting on the SRH teststand which provides pitch and yaw motion to the model. The dimensions associated with the balance centers (both main and nacelle balances) in relation to the hub center and aircraft CG reference location are shown in Figure 4.

The rotor cyclic controls are not located in the classical axis system. Figure 5 shows the location of the actuators in the azimuth and the blade location when the pitch arm is over the actuator. This defines the cyclic axis system used on test.

Sign conventions used for defining the measured forces and moments are depicted in Figure 6. The directions shown being positive forces and moments.

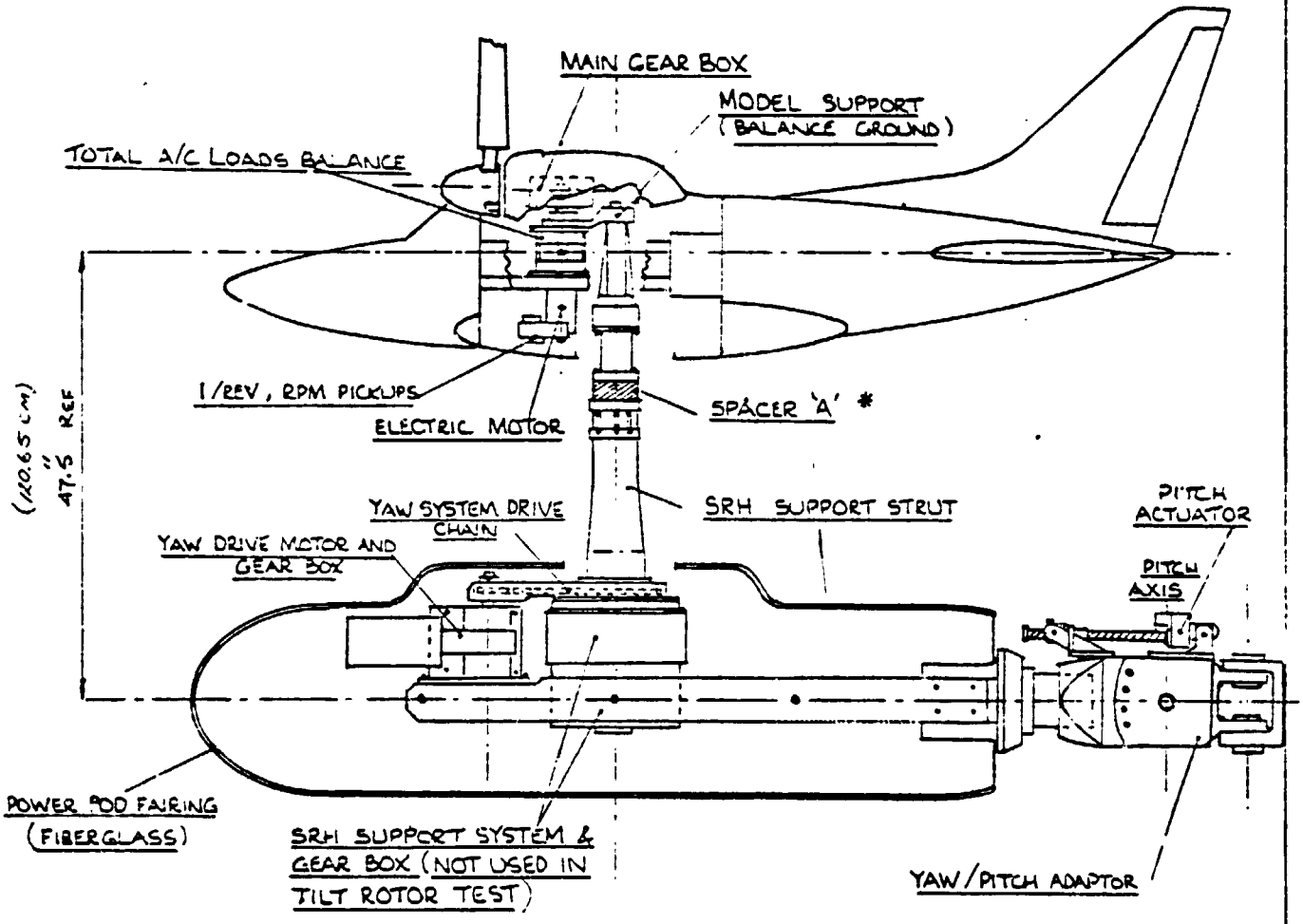
Positive pitch and yaw directions are in the same sense as positive pitch and yaw moments.

In order to provide a ready transformation of model data to full scale, a table of scale factors is given in Table 2.

2.2 Data File Index System

The procedure adopted on test is best explained by referring to Figure 7. This figure depicts the combinations of nacelle incidence I_N and airspeed (shown full scale) selected for

* FOR RUNS 1-26 SPACER 'A' WAS 20" LONG ('DUMMY' SRH BALANCE).
FOR RUNS 27-35 SPACER REPLACED BY SRH BALANCE (20" LONG).
FOR RUNS 36-166 SPACER 'A' FITTED AS DRAWN (2" LONG).



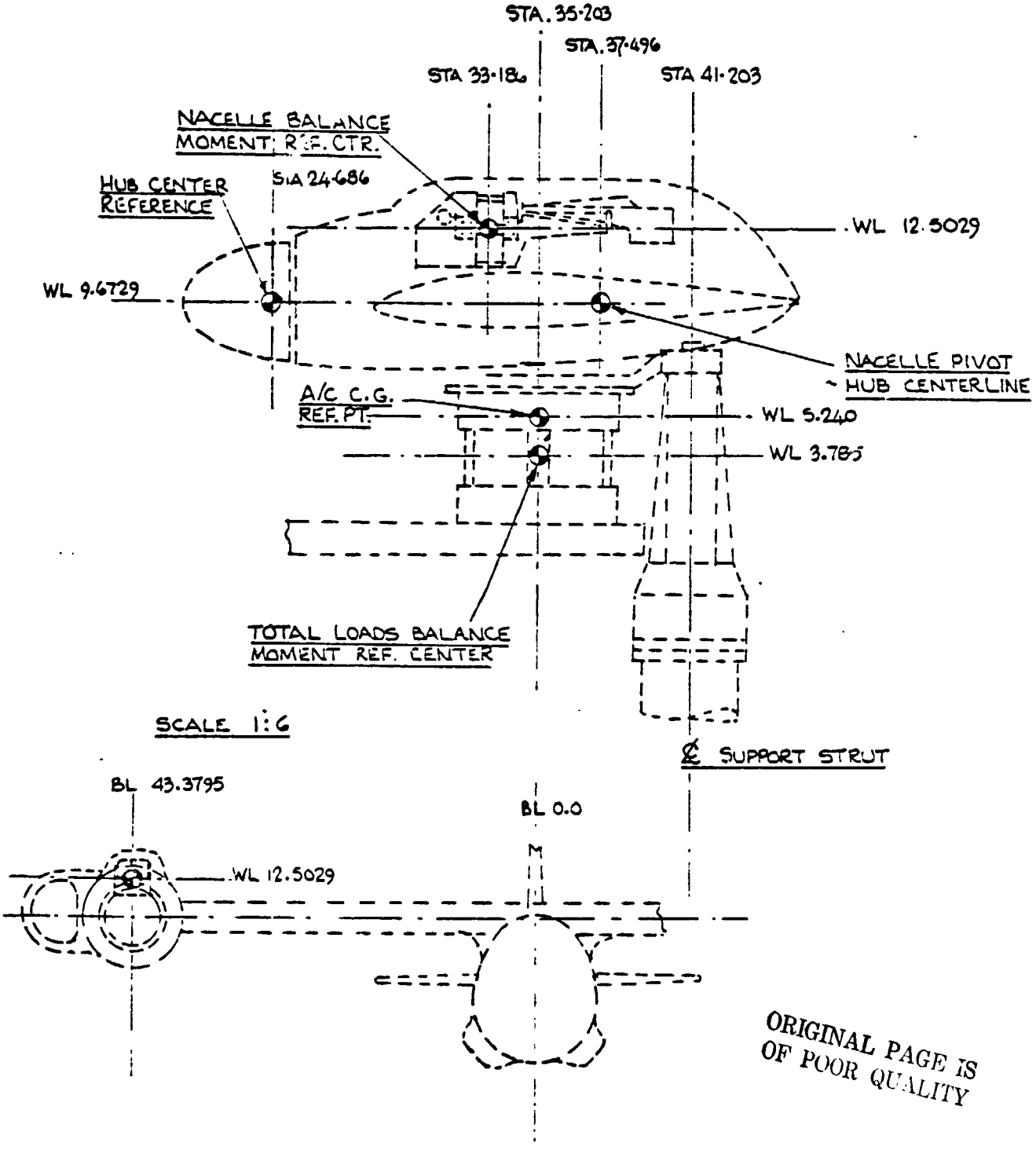
SCALE : 1/20

VR 095Q-1 ~ 1/4.622 SCALE TILT ROTOR MODEL

Figure 3. GENERAL ARRANGEMENT AND INSTALLATION ON SRH TEST STAND

Ref: 6-1-76

FORM 46284 (2 '81)

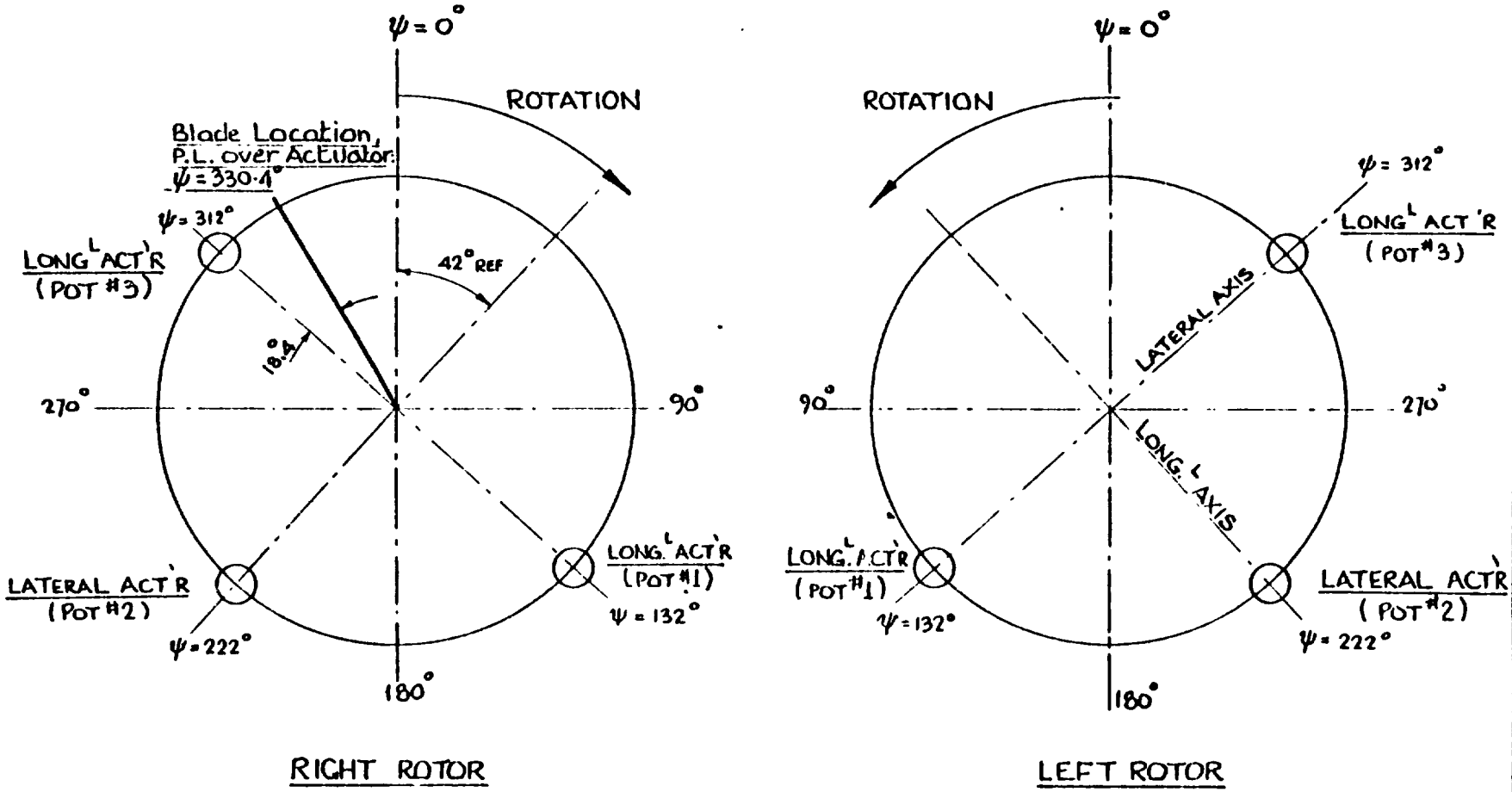


ORIGINAL PAGE IS OF POOR QUALITY

VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 4. RELATIVE BALANCE LOCATIONS & MODEL REFERENCES

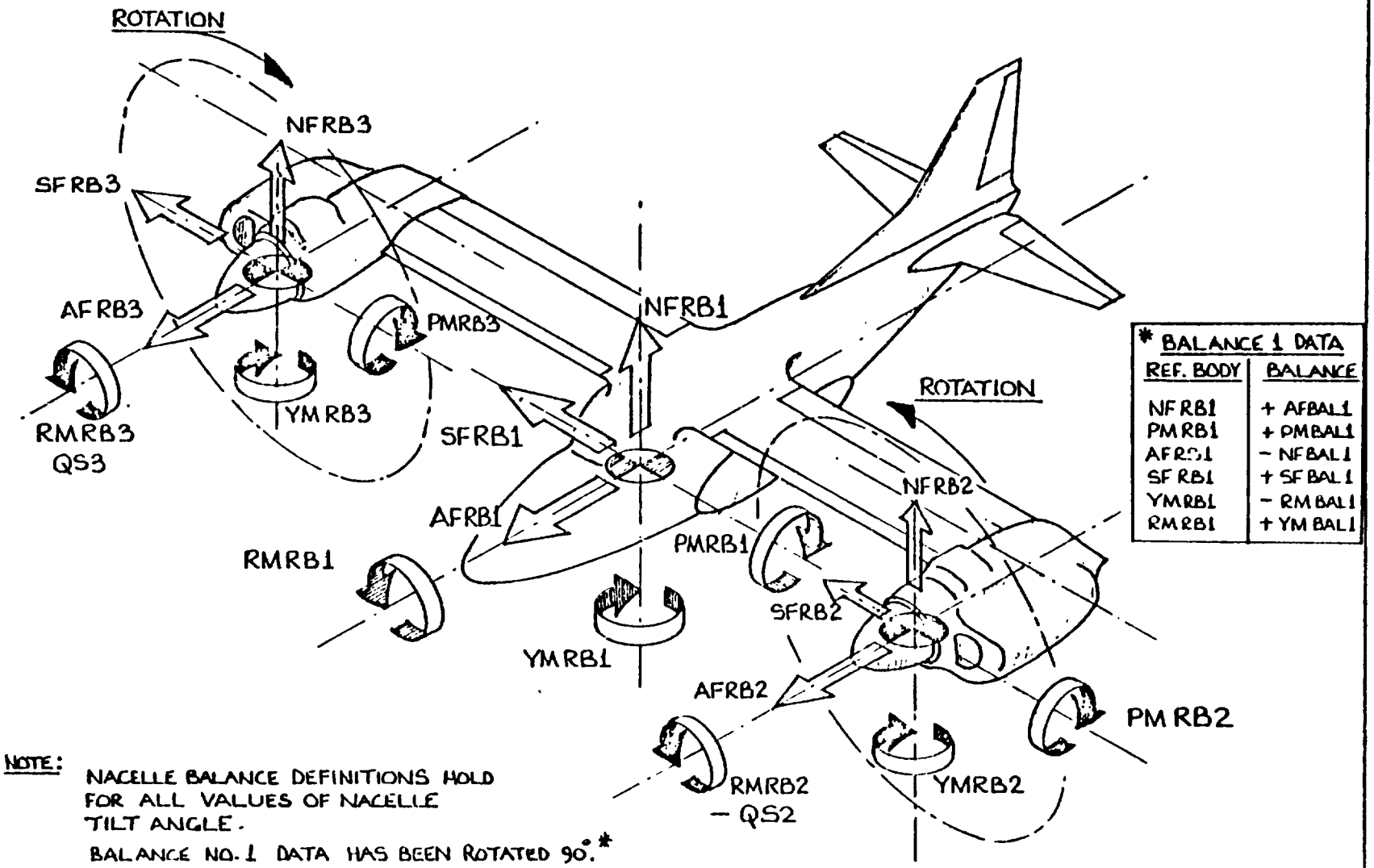
KEF 6/2/76
FORM 46284 (2 '96)



FRONT VIEW ON MODEL, $i_N = 0°$

VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 5. CONTROL SYSTEM ARRANGEMENT



NOTE: NACELLE BALANCE DEFINITIONS HOLD FOR ALL VALUES OF NACELLE TILT ANGLE.
BALANCE NO. 1 DATA HAS BEEN ROTATED 90°.*

VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 6. DEFINITION OF MODEL FORCES & MOMENTS REFERRED TO REF. BODY AXES

SCALE FACTORS

LINEAR DIMENSIONS	4.622
MASS OR WEIGHT	98.739
TIME	2.15
FREQUENCY	0.46514
VELOCITY	2.15
VISCOUS DAMPING	45.927
STIFFNESS	2109.36
SPRING RATE	21.363
MASS MOMENT OF INERTIA	2109.36
FORCE	98.739
STRAIN	1.0
MOMENT OR TORQUE	456.373
POWER	212:278
PER REV FREQUENCY	1.0
DISC LOADING	4.622
MACH NO.	2.1498
FROUDE NO.	1.0
LOCK NO.	1.0

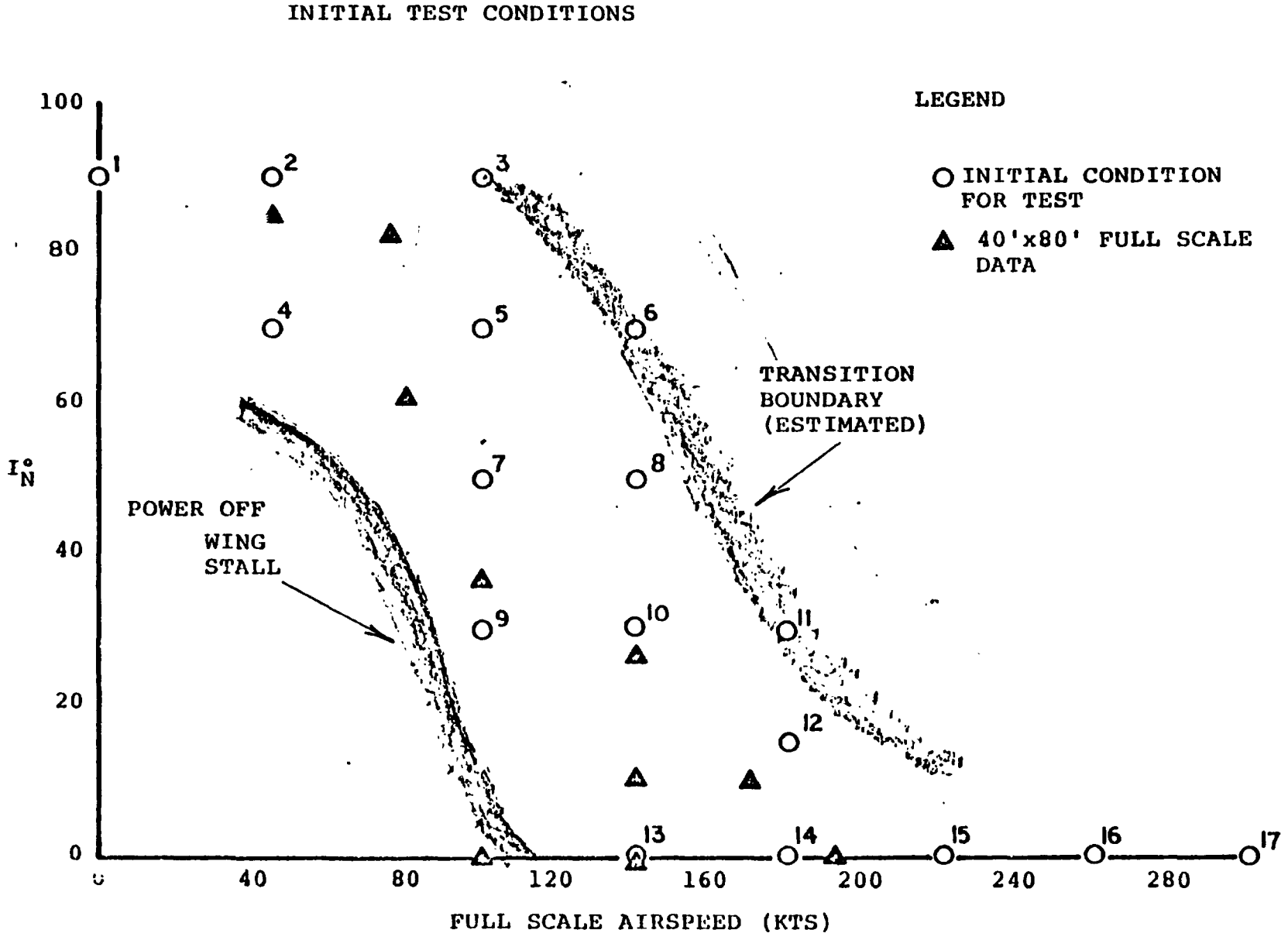


Figure 7. Scope of Test; Initial Test Conditions

initial test conditions. Seventeen initial test conditions are shown and numbered. Data obtained at conditions 1 through 4 is to be found in Volume I. This report contains data from conditions 9, 10, 11 & 12 which are I_N = 30° and 15° at full scale airspeeds of 100, 140 and 180 knots.

The rest of the transition data (conditions 5, 6, 7 and 8) is to be found in Volume II and the cruise flight data (conditions 13 through 17) in Volume IV.

At each initial test condition an approximate aircraft trim altitude was set up and the following variables exercised in turn, angle of attack, yaw angle, longitudinal cyclic pitch, lateral cyclic pitch, collective pitch, wing flap setting and RPM. Each data file corresponding to an initial flight condition contains the six components of force and moment (and power) on the left rotor, the right rotor and also the total airframe forces and moments. This data is followed by alternating chord bending, flap bending and pitch link loads on the left and right rotor respectively. The test variables are first plotted versus α then yaw, etc. as depicted in Table 3. Each appendix number corresponds to a flight condition. For example appendix 9 corresponds to flight condition 9 which is I_N = 30° at a speed which is representative of full scale 100 knots. Thus Figures 9-001 through 9-024 are the measured data as functions of α. Figures 9-025 through 9-048 are the measured data as

TRANSITION DATA ORGANIZATION

- LEFT ROTOR: C_T, C_P, C_{NF}, C_{SF}, C_{PM}, C_{YM}
- RIGHT ROTOR: C_T, C_P, C_{NF}, C_{SF}, C_{PM}, C_{YM}
- TOTAL AIRCRAFT: C_L, C_{SF}, C_{AX}, C_{PM}, C_{YM}, C_{RM}

VS

- α^0
- YAW^0
- LONGITUDINAL CYCLIC
- LATERAL CYCLIC
- θ_{75}^0
- δ_F^0
- RPM

ALT CHORD BENDING LEFT

ALT FLAP BENDING LEFT

ALT PITCH LINK LOAD LEFT

ALT CHORD BEND RT

ALT FLAP BEND RT

ALT PITCH LINK LOAD RT

TABLE 3. TEST VARIABLE PLOTTING SEQUENCE

functions of yaw angle and so on. This organization and sequencing of test information is only changed when measured data were found to be spurious for reasons of instrumentation failure, etc. as noted in the instrumentation log given in Volume I.

Section 3 of this report contains notes pertaining to the data sets shown in this document and provides an account of the cases where data was found to be in error and discarded and also those cases where although no proof of error is apparent the information should be treated with caution. Fortunately, these cases amount to a small fraction of the overall results.

One further notation is necessary before the data provided can be usefully interpreted. During a run where one test variable is being exercised it is necessary to know the constant values of the other test variables. These data are identified in Table 4 for test conditions 9 through 12 and are referenced by data set number, figure number and test variable name all of which are also given on the corresponding data graphs in the appendix. Thus for data set 9 the test constants during the angle of attack sweep on Run 89 (Data figures 9-001 to 9-024) can be obtained from Table 4 as

V Full Scale (Kts)	99 Kts.
αfuse	Variable

TEST VARIABLES HELD CONSTANT

CONDITION	PARAMETER VARIED	FIGURES	V	α_{FUSE}	I_N	RPM	θ_{75_L}	A_{1_L}	B_{1_L}	δ_{F_L}	θ_{75_R}	A_{1_R}	B_{1_R}	δ_{F_r}	β	DATA SET
TRANSITION	α	1-24	100		26	1063	20.0	2.8	3.4	30.0	18.2	3.7	3.8	30.0	0	9
I_N = 30°	YAW ANGLE	25-48	100	3.5	28	1063	20.6	2.8	3.4	30.0	18.2	3.7	3.6	30.0		
V_{FS} = 100 KTS	LONG. CYC.	49-72	100	3.5	29	1063	20.7	2.8		30.0	18.0	3.6		30.0	0	
	LAT. CYC.	73-96	100	3.5	29	1063	20.8		3.6	30.0	18.1		3.6	30.0	0	
	$\theta_{.75}$	97-120	100	3.5	29	1063		3.1	3.4	30.0		3.7	3.5	30.0	0	
	δ_{FLAP}	121-144	100	3.5	30	1063	20.7	3.1	3.5		18.1	3.8	3.5		0	
	RPM	145-168	100	3.5	30		20.7	3.1	3.5	30.0	18.1	3.8	3.5	30.0	0	
TRANSITION	α	1-24	140		30	1065	28.8	4.5	4.0	33.0	26.9	5.1	4.3	32.0	0	10
I_N = 30°	YAW ANGLE	25-48	140	-3.0	30	1065	29.0	4.5	3.9	33.0	27.1	5.0	4.4	32.0		
V_{FS} = 140 KTS	LONG. CYC.	49-72	140	-3.0	30	1064	29.0	4.4		33.0	26.0	5.0		32.0	0	
	LAT. CYC.	73-96	140	-3.0	30	1064	29.0		3.9	33.0	27.0		4.4	32.0	0	
	$\theta_{.75}$	97-120	140	-3.0	30	1065		4.4	3.7	33.0		5.0	4.3	32.0	0	
	δ_{FLAP}	121-144	140	-3.0	30	1063	29.1	4.4	3.9		27.0	5.1	4.3		0	
	RPM	145-168	140	-3.0	30		29.1	4.4	3.9	31.0	27.0	5.1	4.3	31.0	0	
TRANSITION	α	1-24	180		30	1065	32.1	6.0	5.0	30.0	32.3	6.0	5.3	30.0	0	11
I_N = 30°	YAW ANGLE	25-48	180	-5.9	30	1065	32.1	5.9	5.0	30.0	32.2	6.0	5.3	30.0		
V_{FS} = 180 KTS	LONG. CYC.	49-72	180	-5.9	30	1065	32.0	6.2		30.0	32.0	6.0		30.0	0	
	LAT. CYC.	73-96	180	-5.9	30	1063	32.3		4.8	30.0	32.2		5.3	30.0	0	
	$\theta_{.75}$	97-120	180	-5.9	30	1065		6.3	5.0	30.0		6.2	5.5	30.0	0	
	δ_{FLAP}	121-144	180	-5.9	30	1063	31.9	6.3	5.0		32.3	6.4	5.5		.1	
	RPM	145-168	180	-5.9	30		31.9	6.3	5.0	30.0	32.3	6.4	5.6	30.0	.1	
TRANSITION	α	1-24	180		15	945	37.5	4.2	3.5	19.5	38.0	4.0	4.1	19.7	0	12
I_N = 15°	YAW ANGLE	25-48	180	-1.99	15	946	37.5	4.3	3.4	19.5	37.6	4.5	3.8	19.7		
V_{FS} = 180 KTS	LONG. CYC.	49-72	180	-1.99	15	945	37.5	4.2		19.5	37.7	4.0		19.7	.5	
	LAT. CYC.	73-96	180	-1.99	15	942	37.7		3.5	19.5	38.0		4.0	19.7	.5	
	$\theta_{.75}$	97-120	180	-1.99	15	945		4.5	3.5	19.5		4.0	4.0	19.7	.5	
	δ_{FLAP}	121-144	180	-1.99	15	945	37.4	4.2	3.3		37.6	4.3	4.0		.5	
	RPM	145-169	180	-1.99	15		37.5	4.2	3.3	20.7	37.6	4.1	4.0	20.0	.5	

TABLE 4. TEST VARIABLES HELD CONSTANT

I_N	26°
RPM	1063
$\theta_{.75}$ left	
A_1 left	2.8°
B_1 left	3.4
δ_F left	30°
$\theta_{.75}$ right	18.2
A_1 right	3.7°
B_1 right	3.8°
δ_F right	30°
Yaw angle β	0°

3.0 DATA DESCRIPTION

The test data provided in this test volume were obtained on test runs 89 through 102 and 111 through 125. A log of the test program can be found in Volume I, Reference . The purpose of this section is to make the user aware of test conditions or problem areas which impact the interpretation of the information obtained. A complete log of instrumentation changes is provided in Volume I. Reference .

In the four data sets provided in this volume, the only important problem to bear in mind is that the right hand rotor side force channel was discovered to be saturating on run 82 and set to zero until run 96. For this reason the right hand rotor side force and yawing moment data in data set 9 have been deleted. The calibration procedure for the nacelle balances was such that the calibration center was taken as the hub center line. This means that the interaction of side force on yaw moment is quite large and both channels are seriously affected. The other right rotor data channels are included since the interactions are not large; however, interpretation of the right rotor balance data must proceed with caution.

On run 96 and all subsequent runs the left hand rotor side force signal was fed into the right hand side force channel with an inverted sign to preserve sign conventions. For Data Sets 10, 11, and 12, the right rotor side force data reflects the left rotor side force raw signal processed with the right rotor data.

This procedure should yield reasonable right hand rotor results for symmetric test conditions; however, the left rotor data should be considered to be the more precise of the two measurements.

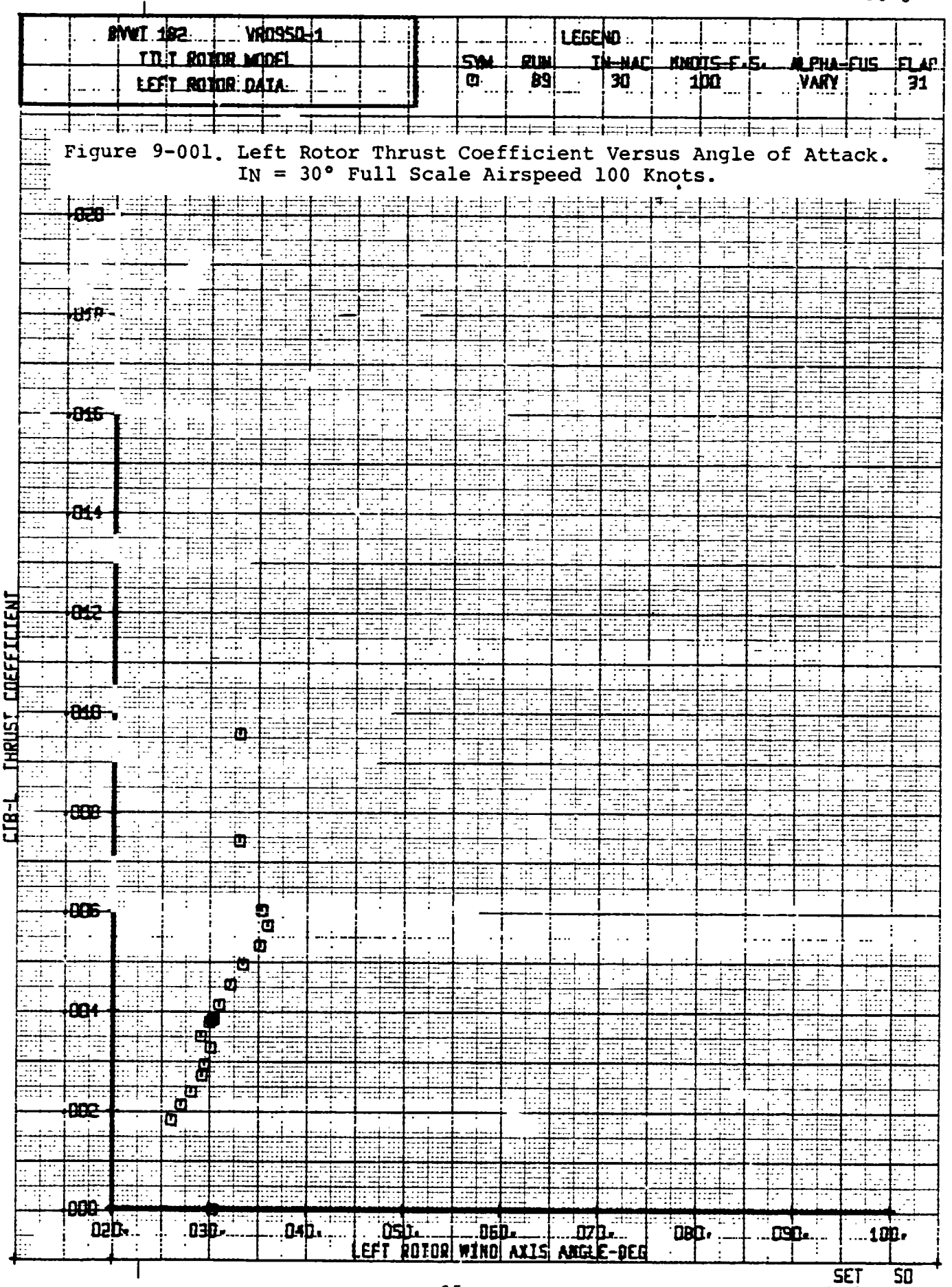


Figure 9-001. Left Rotor Thrust Coefficient Versus Angle of Attack. IN = 30° Full Scale Airspeed 100 Knots.

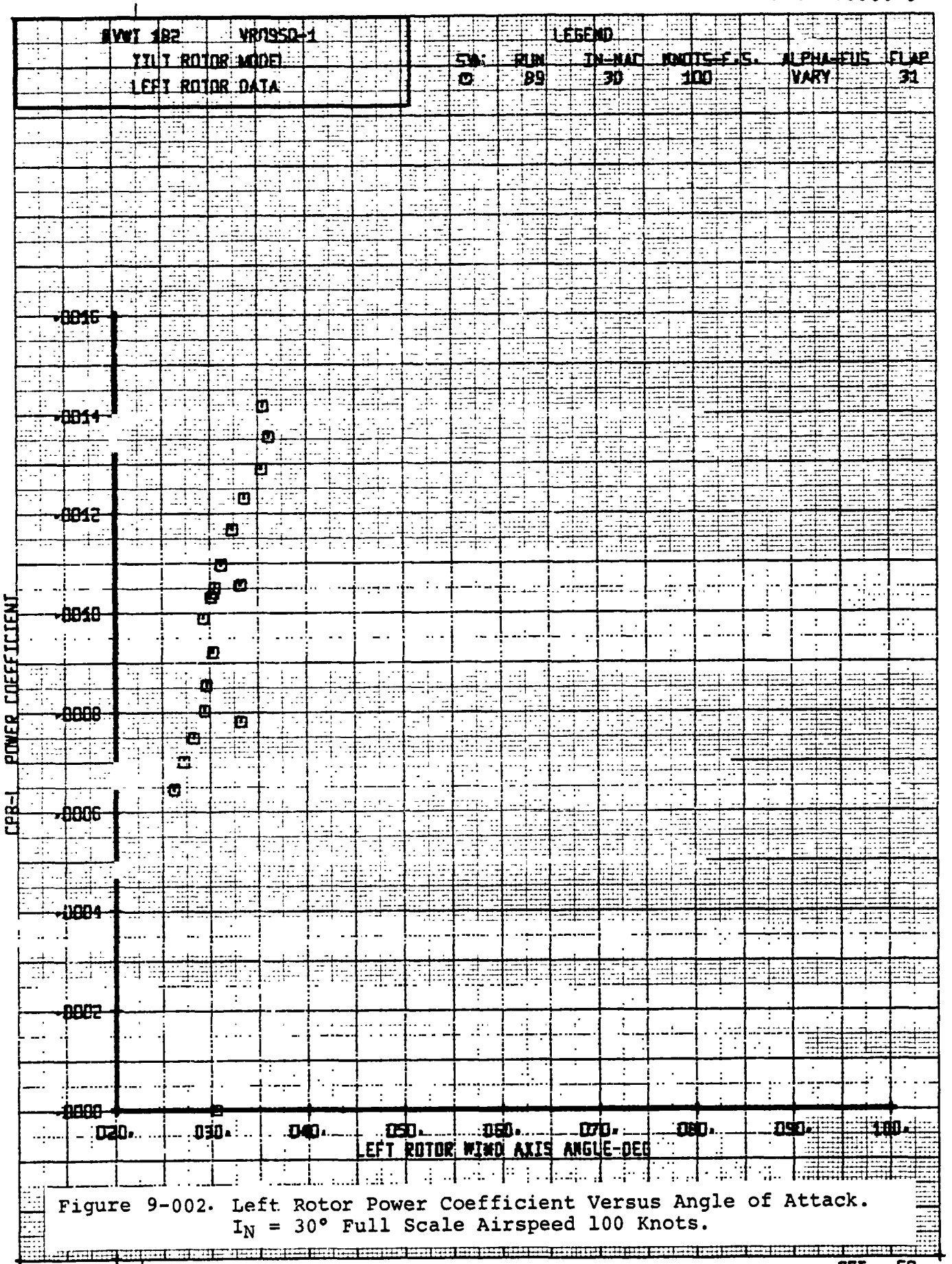


Figure 9-002. Left Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

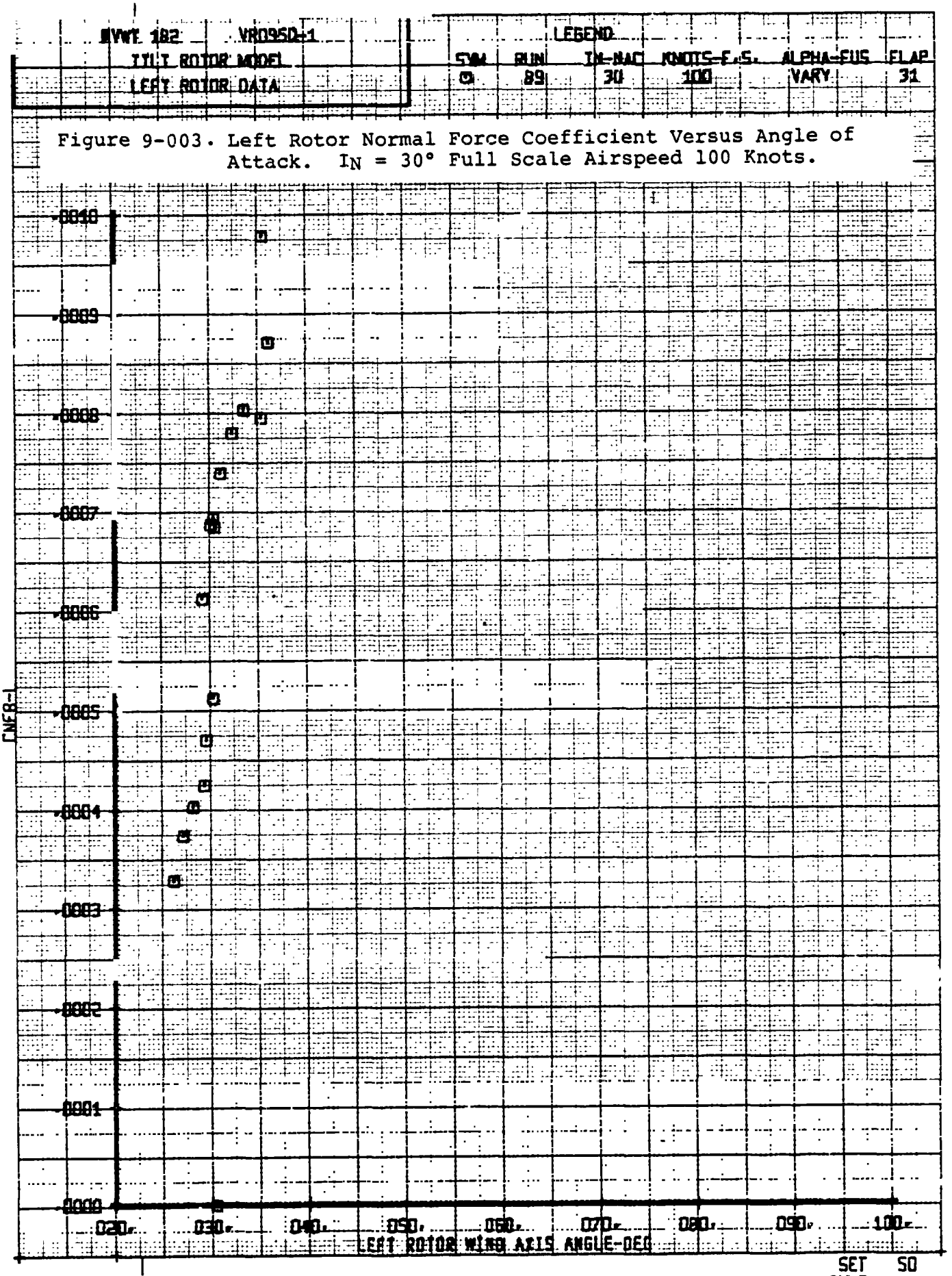


Figure 9-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

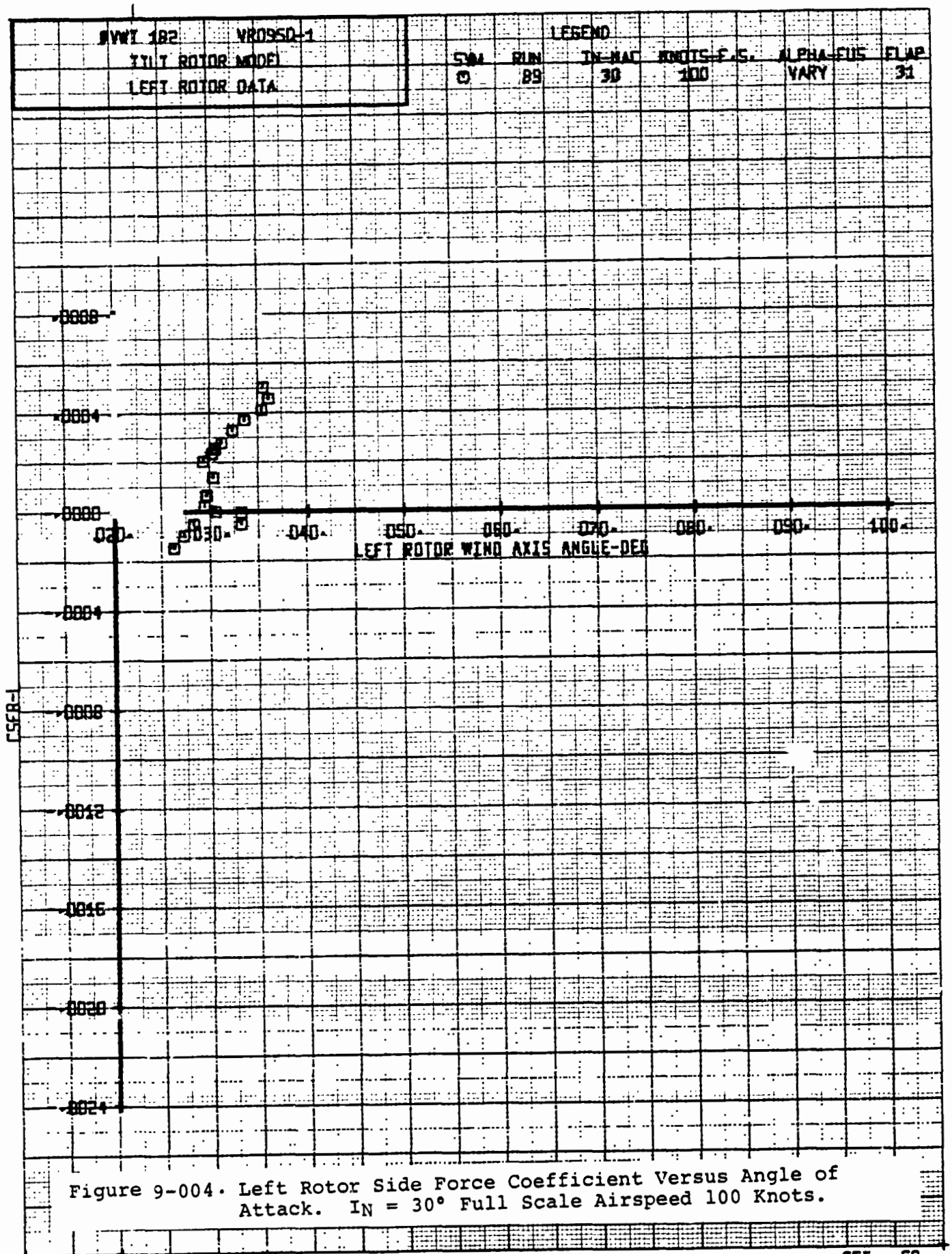


Figure 9-004. Left Rotor Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

SET SD
BVWT 182

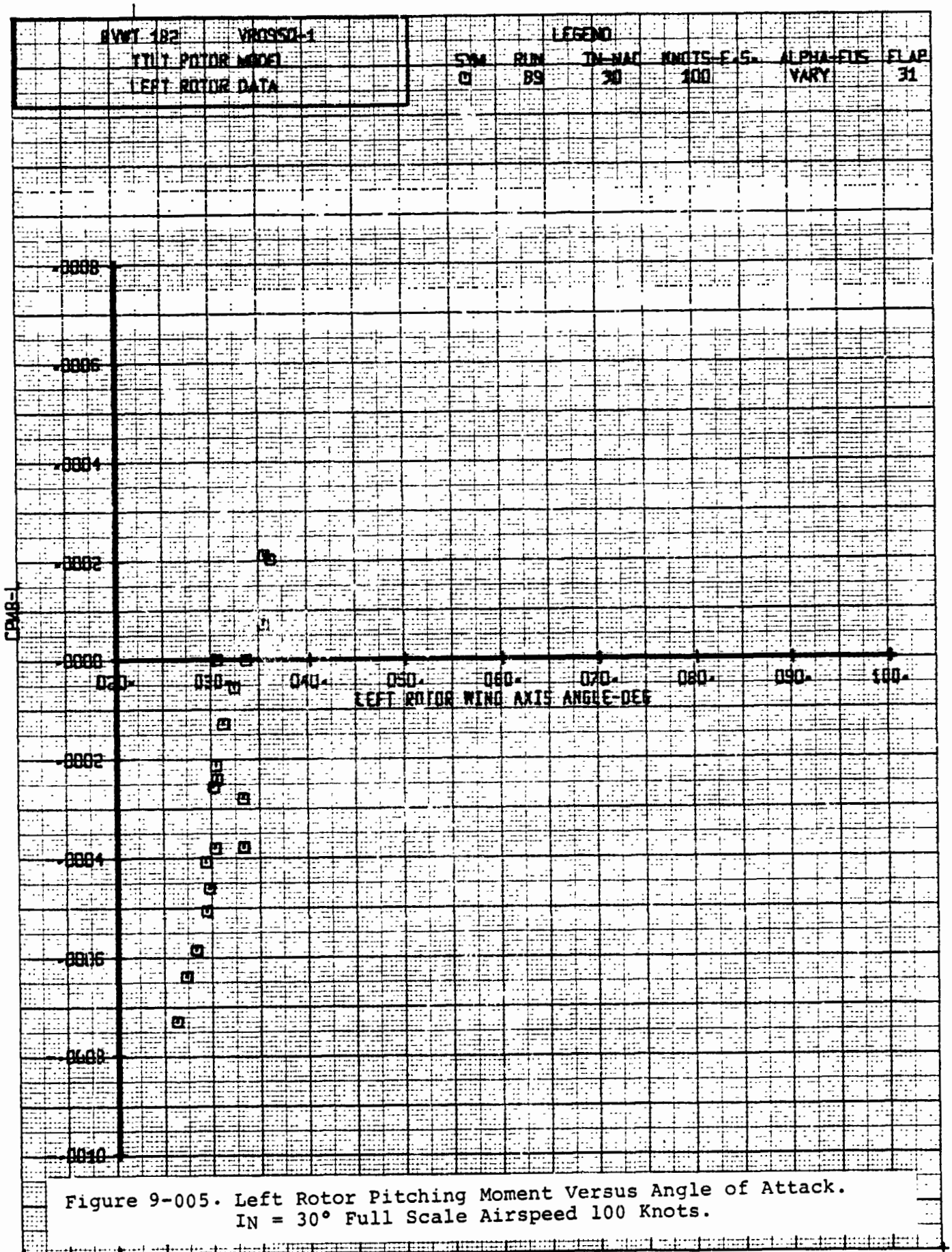


Figure 9-005. Left Rotor Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

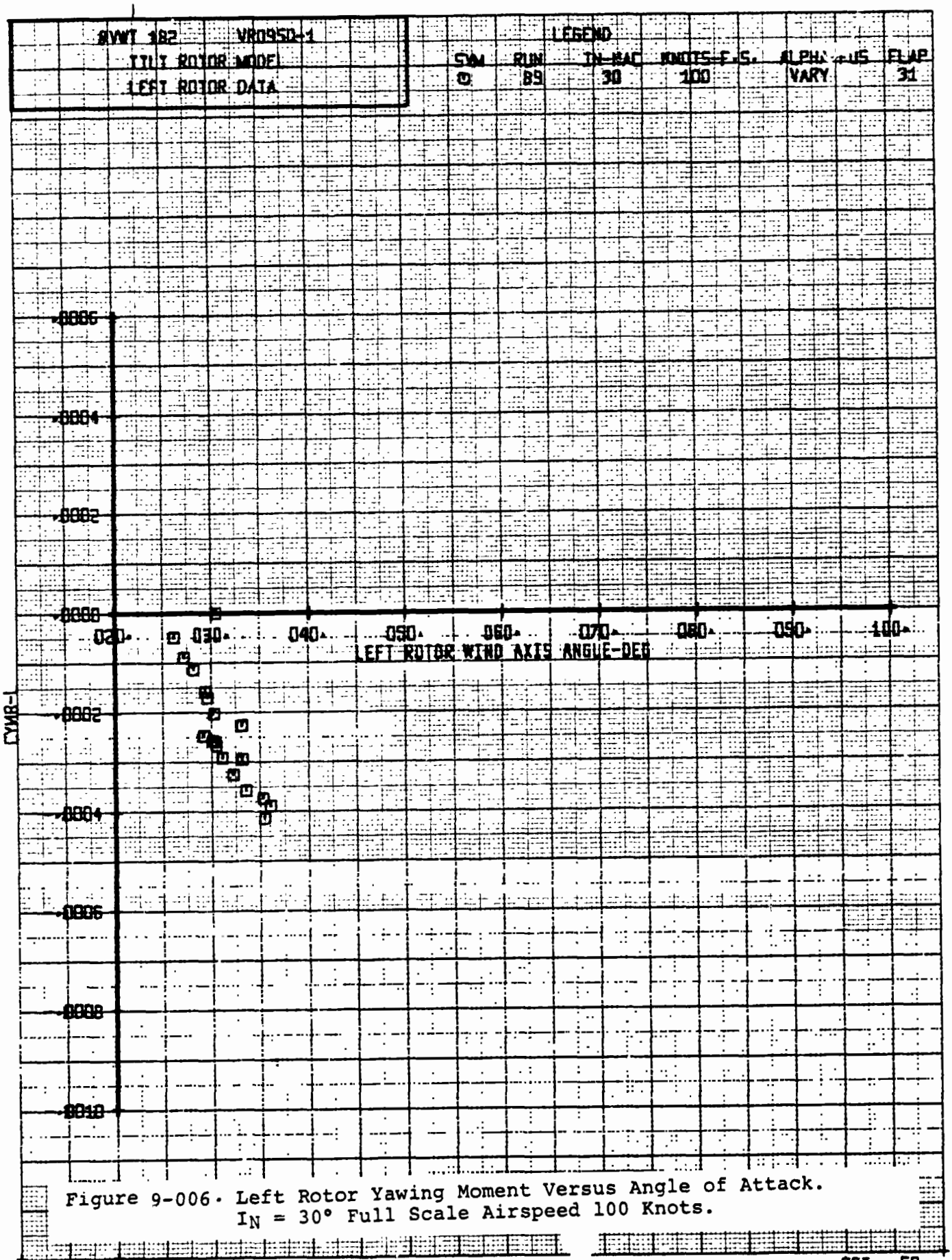


Figure 9-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

SD 182

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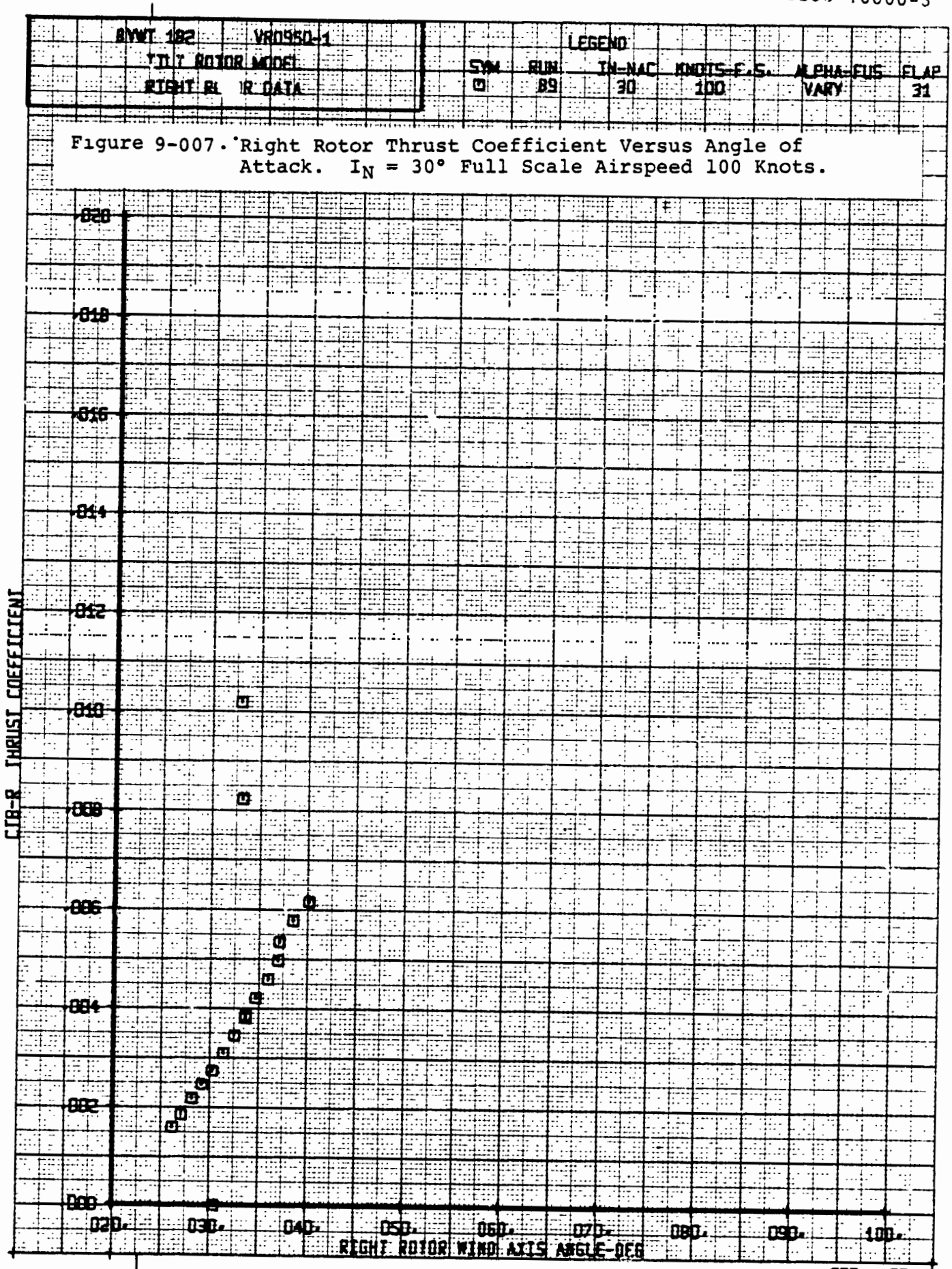

Figure 9-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

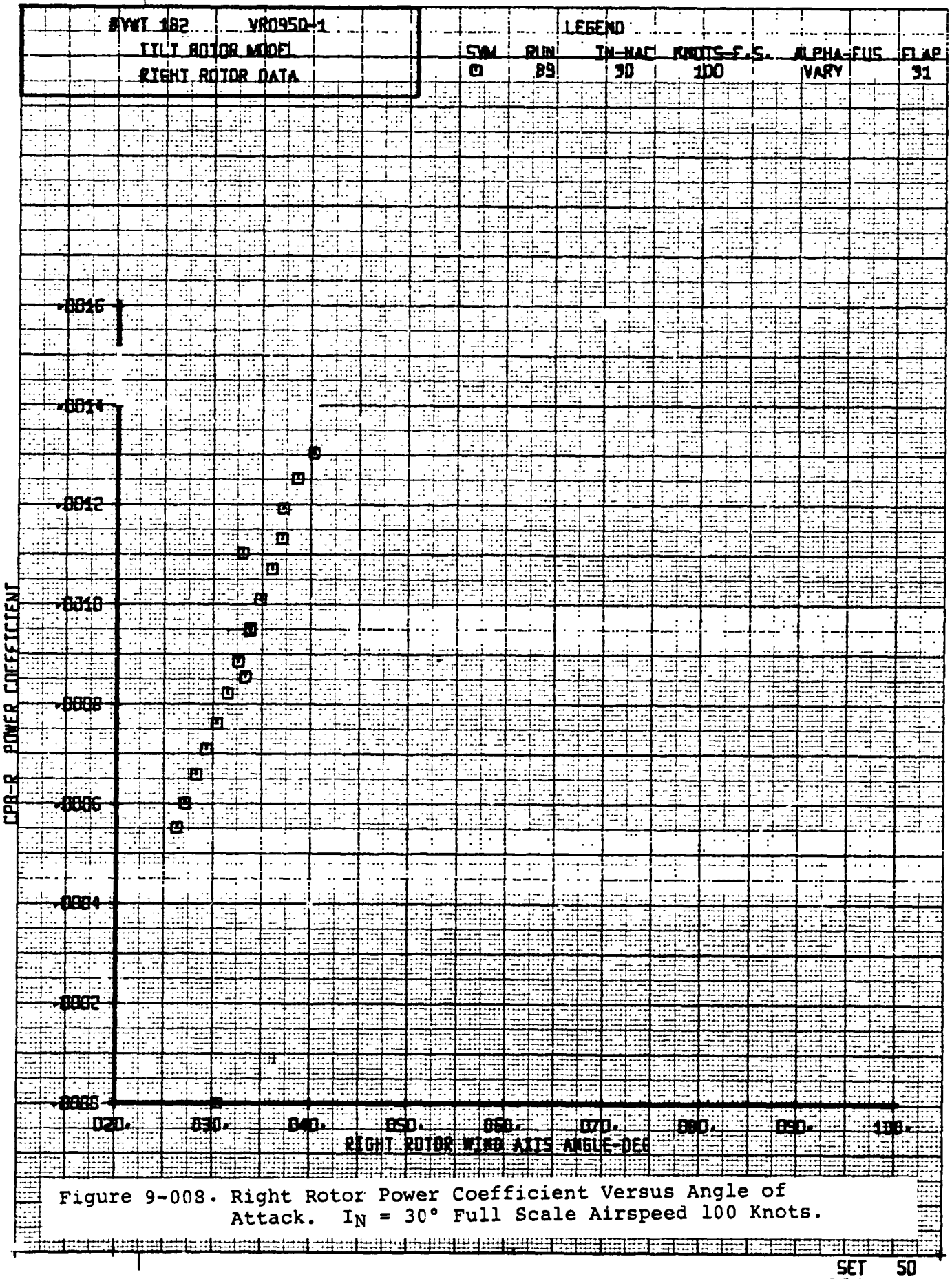

Figure 9-008. Right Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

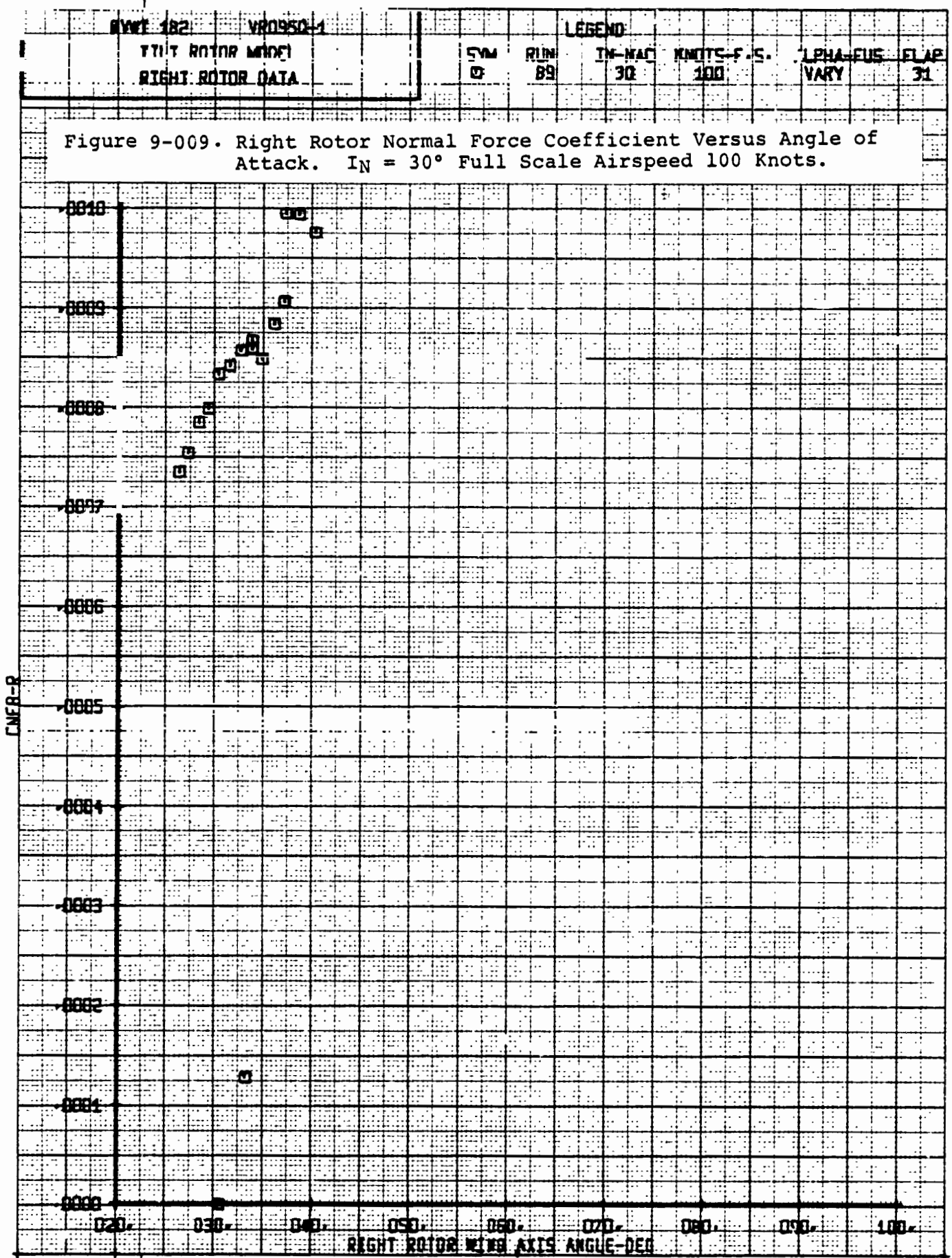

Figure 9-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

Data Deleted

Refer to Section 3.0

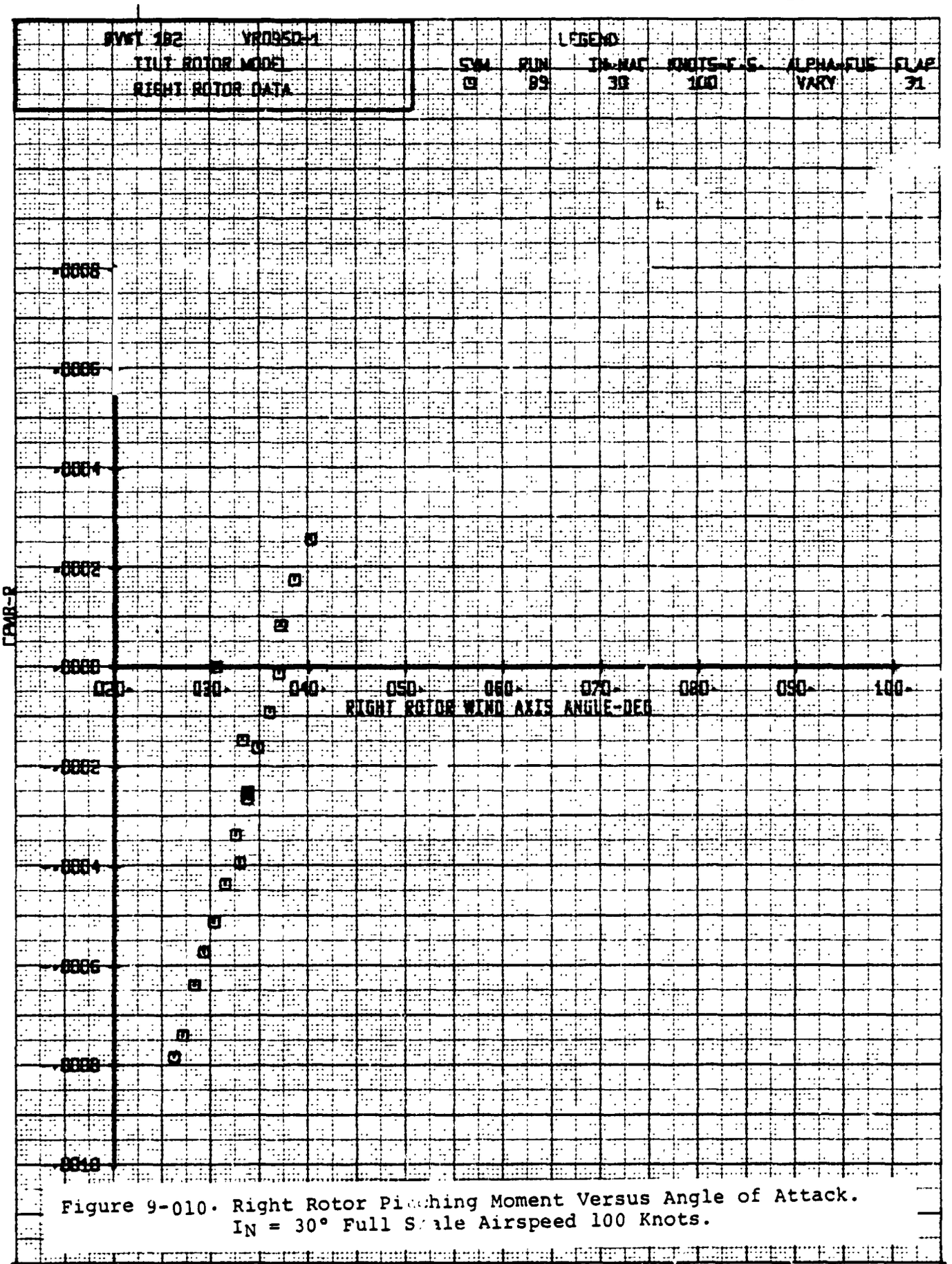

Figure 9-010. Right Rotor Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

Data Deleted

Refer to Section 3.0

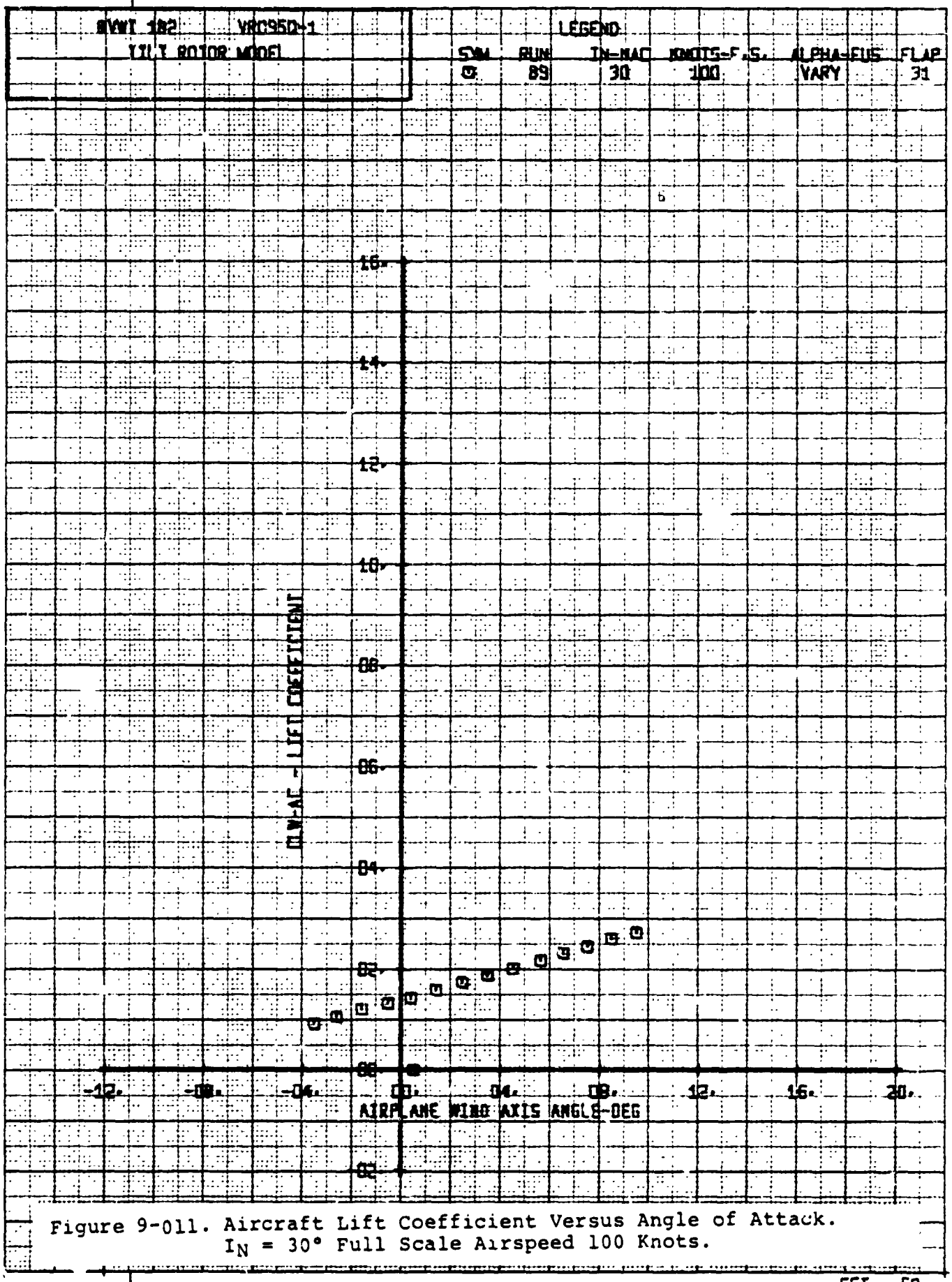

Figure 9-011. Aircraft Lift Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

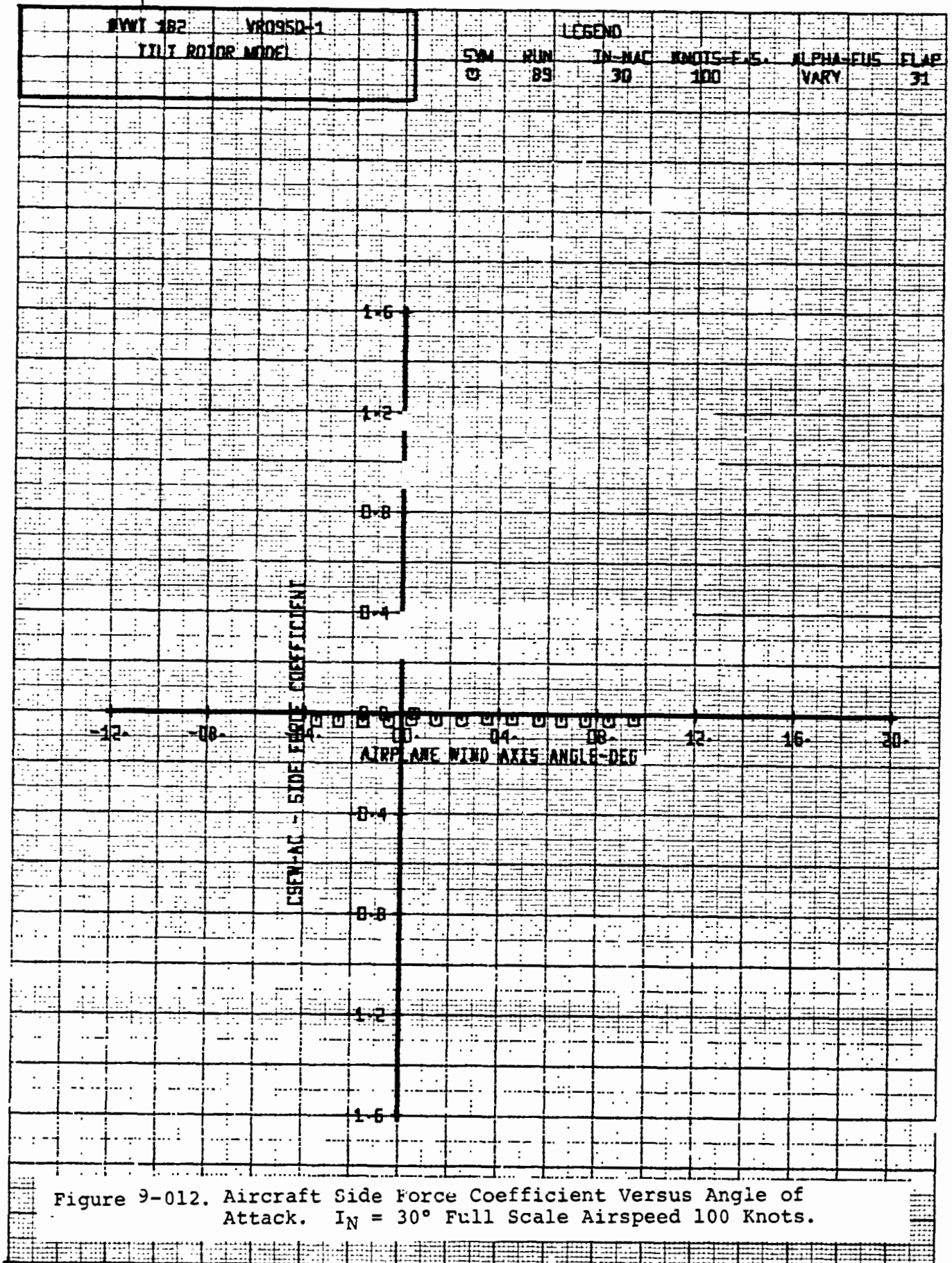

Figure 9-012. Aircraft Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

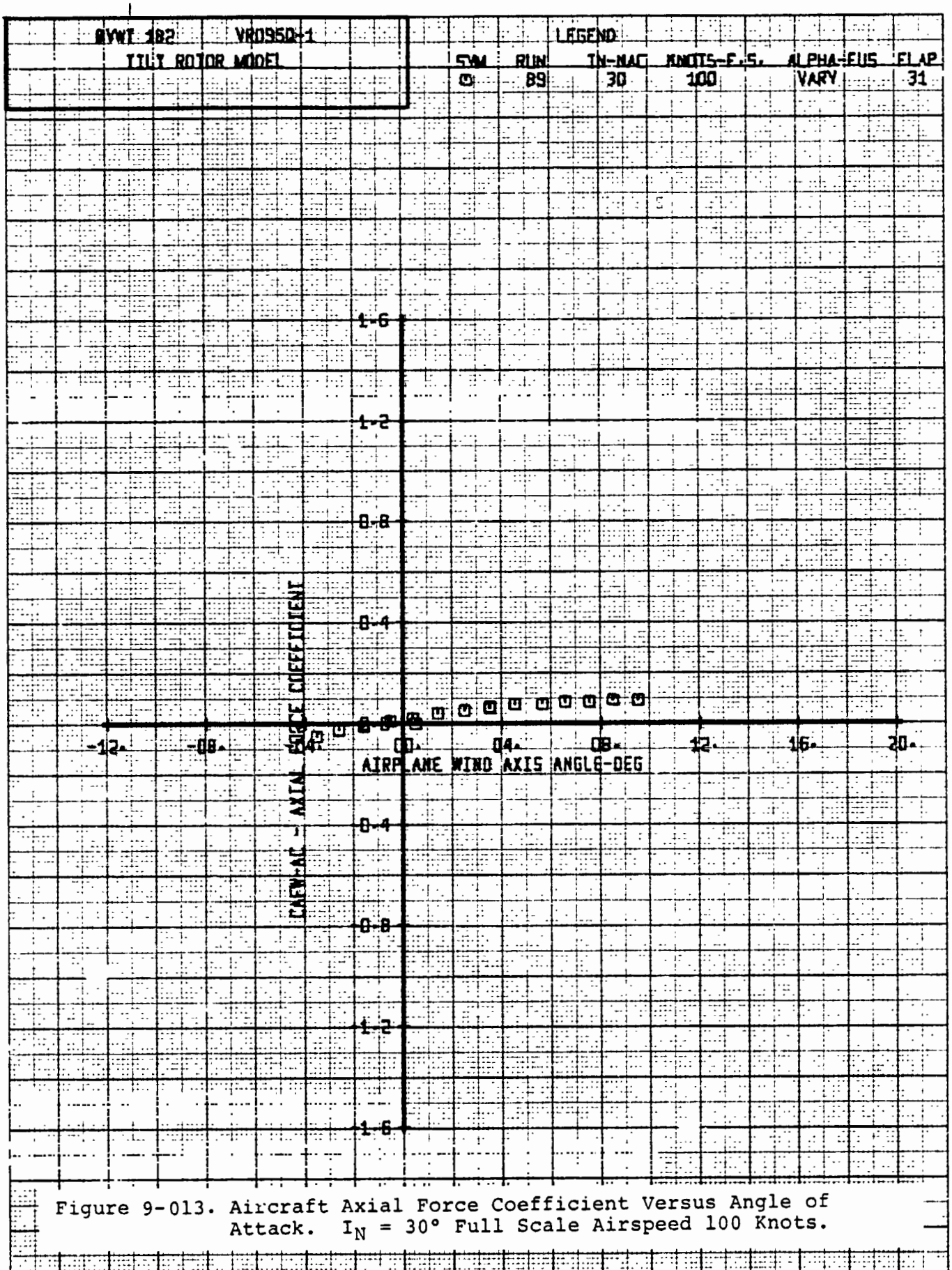

Figure 9-013. Aircraft Axial Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

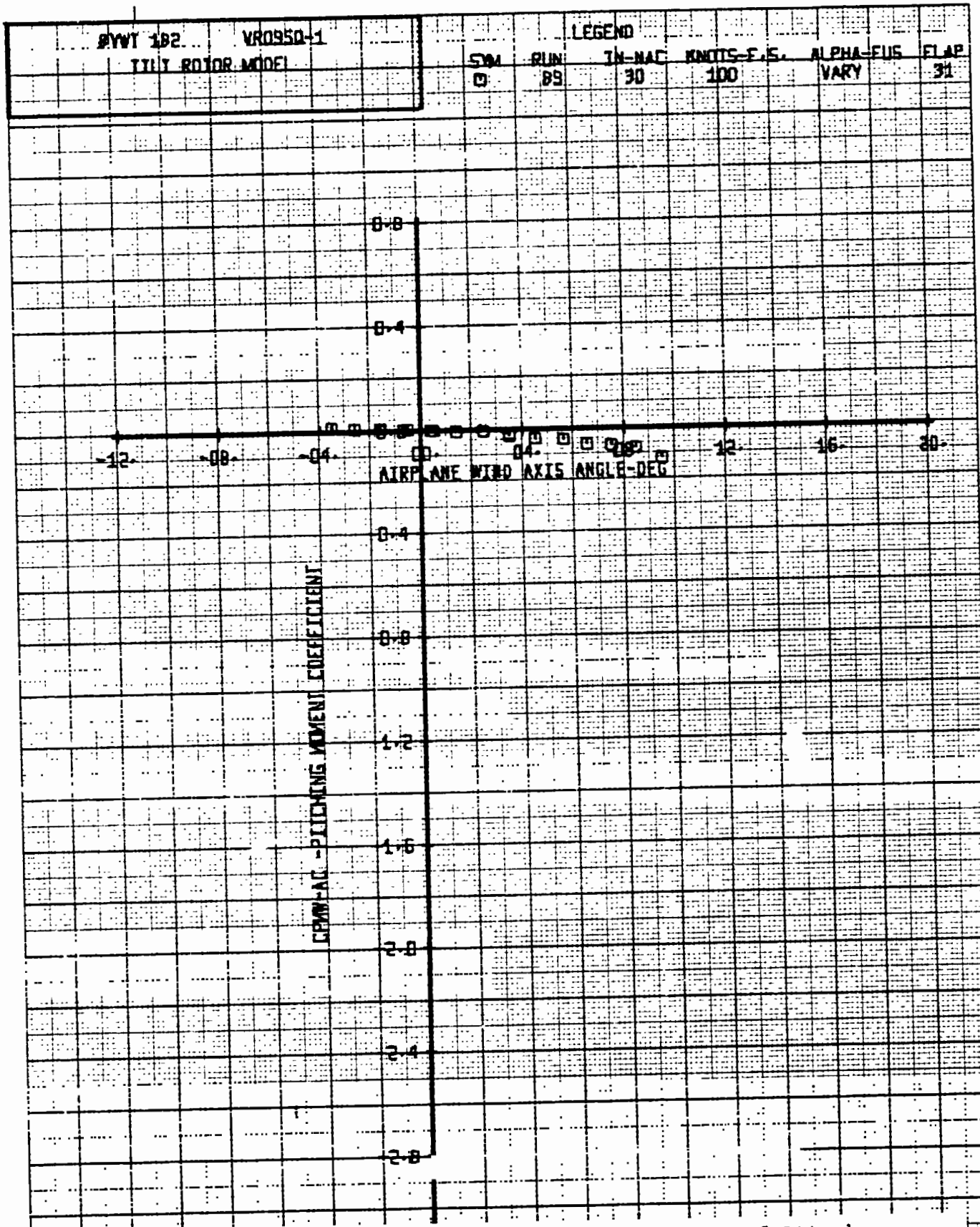

Figure 9-014. Aircraft Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

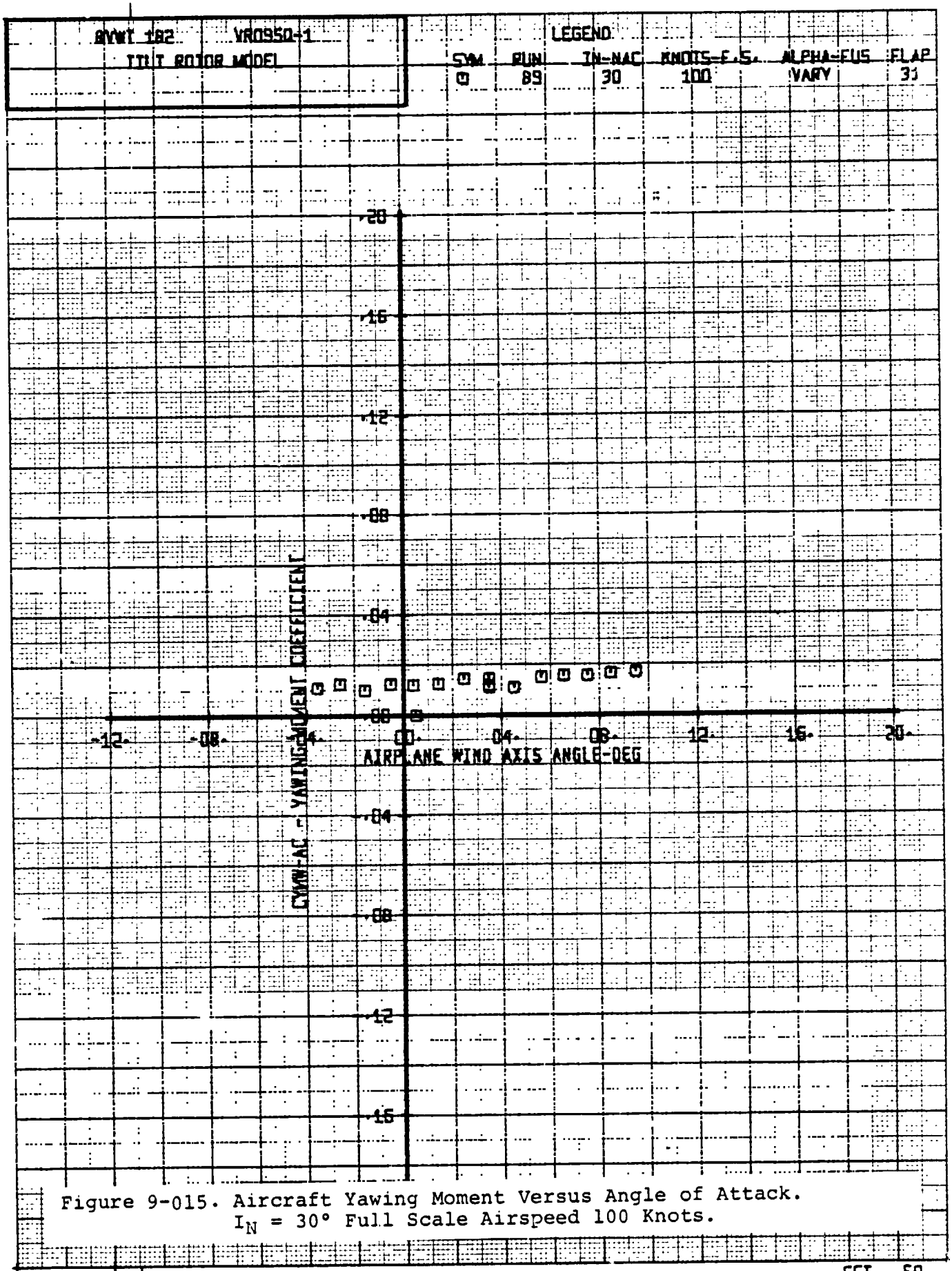

Figure 9-015. Aircraft Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

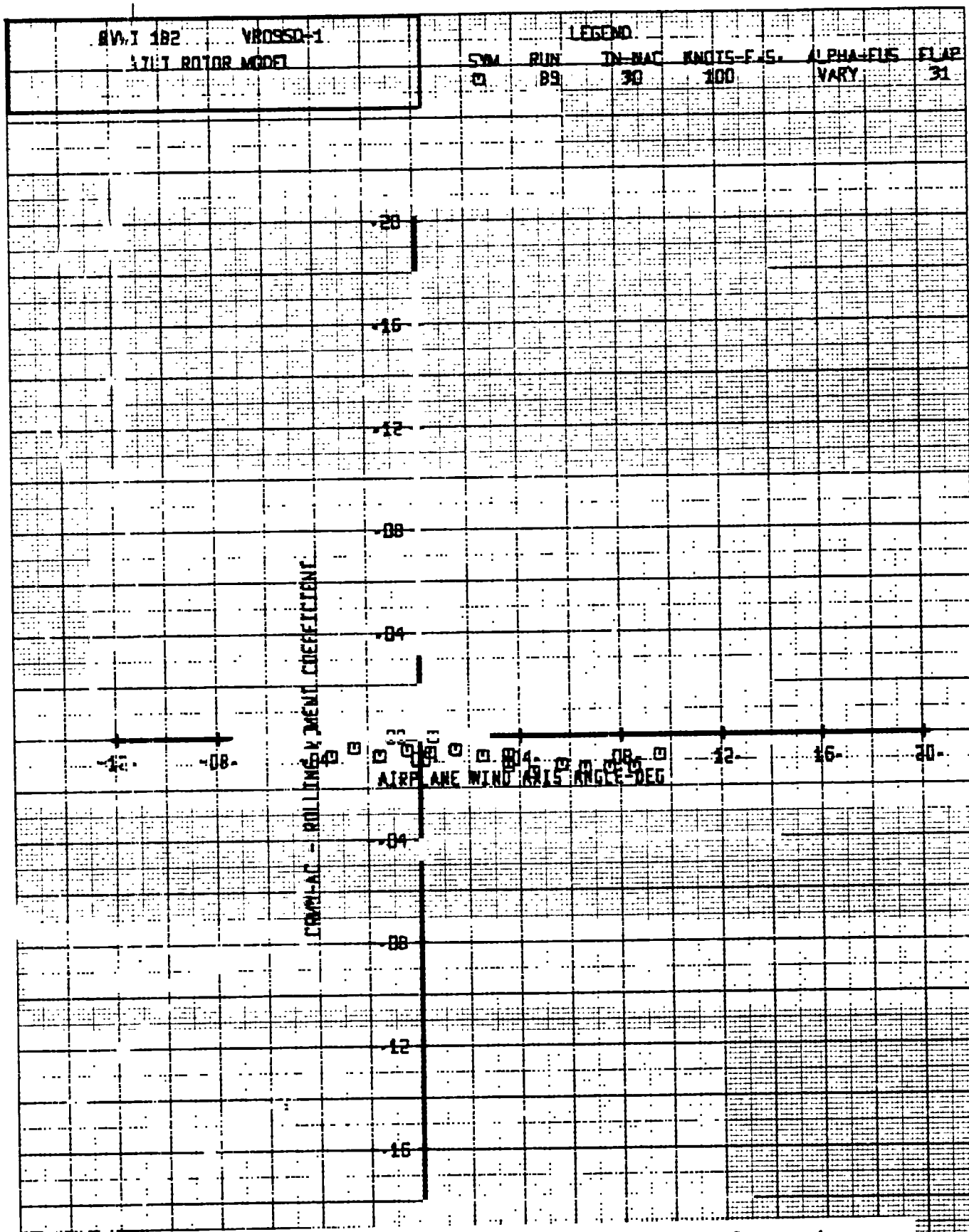

Figure 9-016. Aircraft Rolling Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

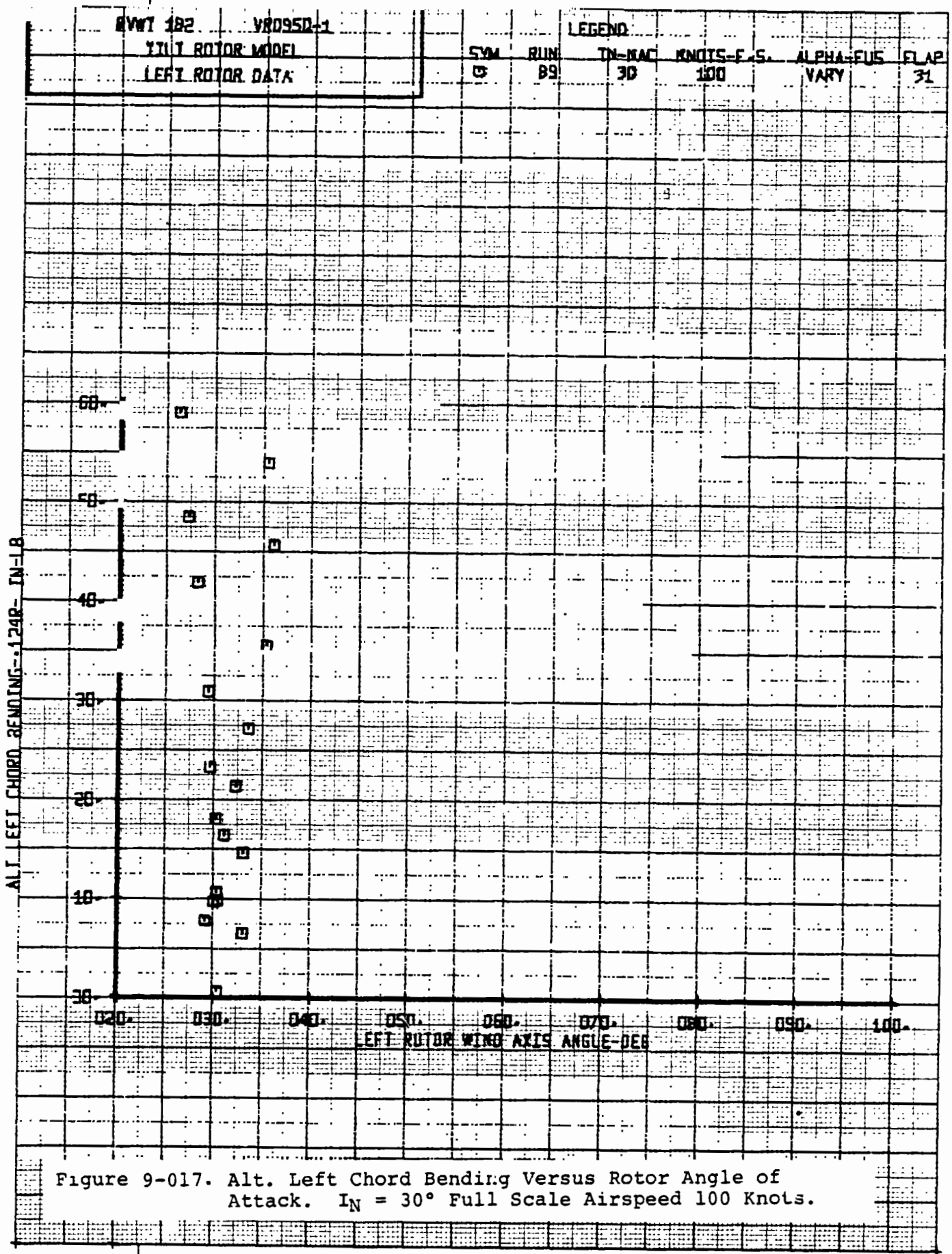

Figure 9-017. Alt. Left Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

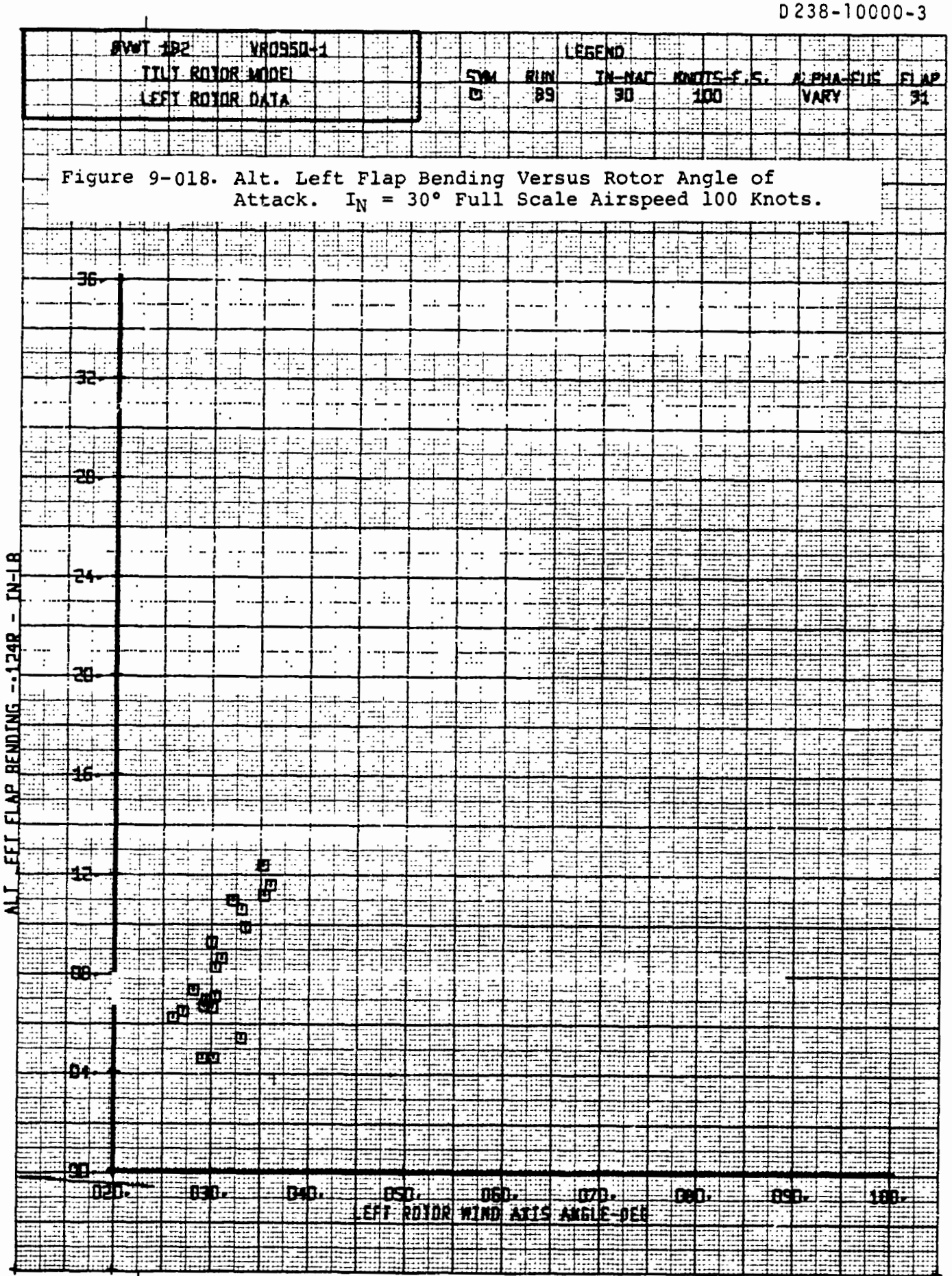

Figure 9-018. Alt. Left Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

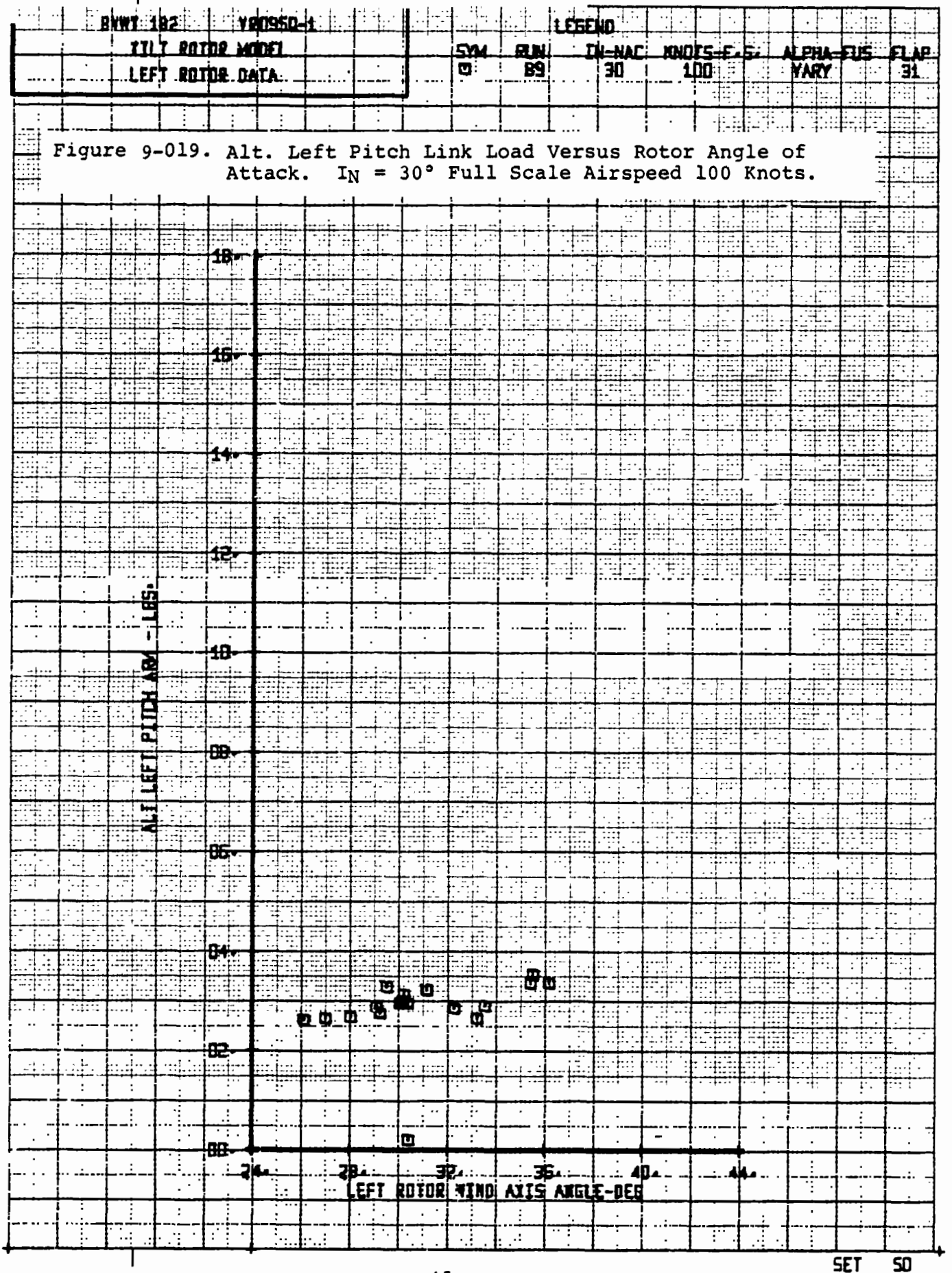

Figure 9-019. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

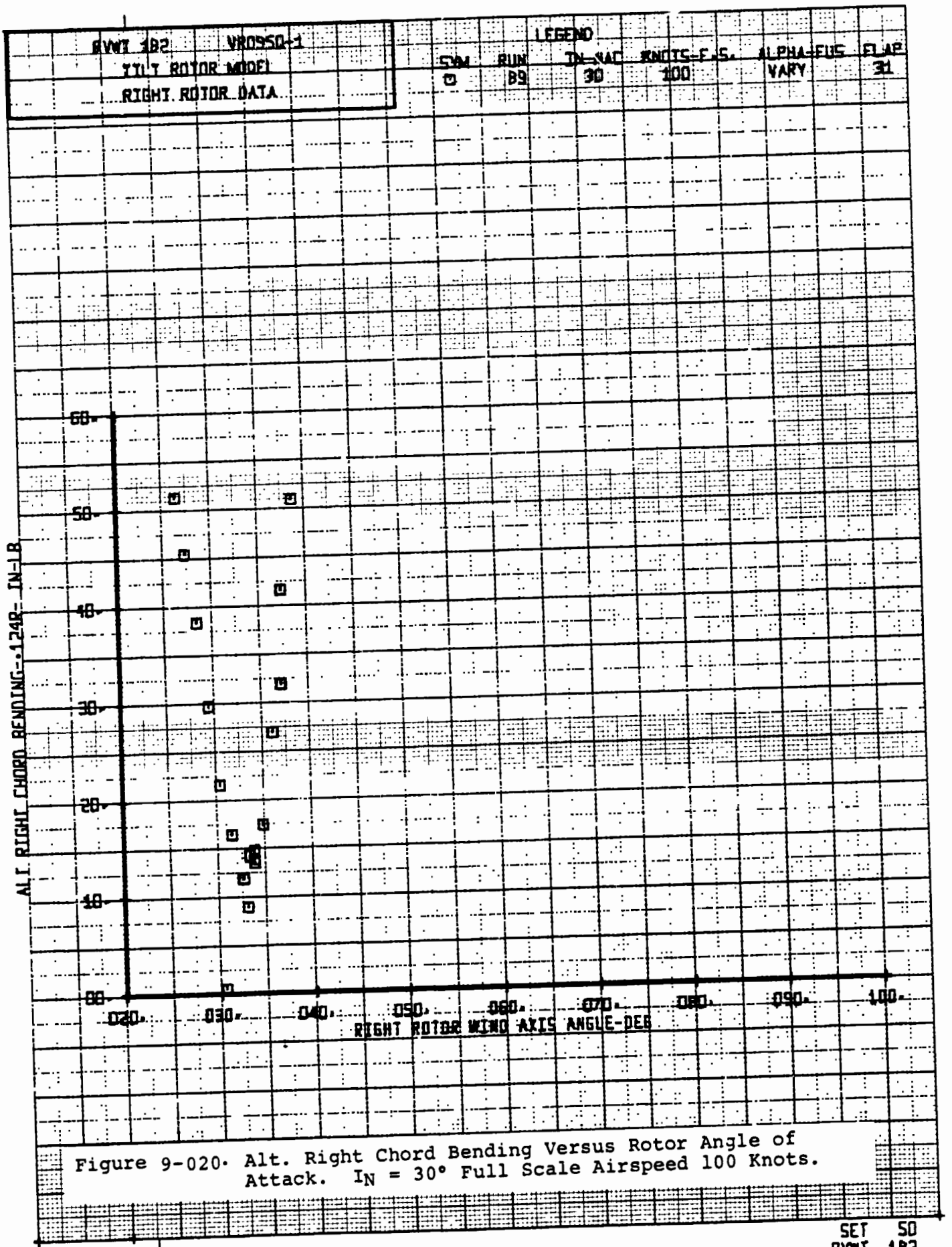

Figure 9-020. Alt. Right Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

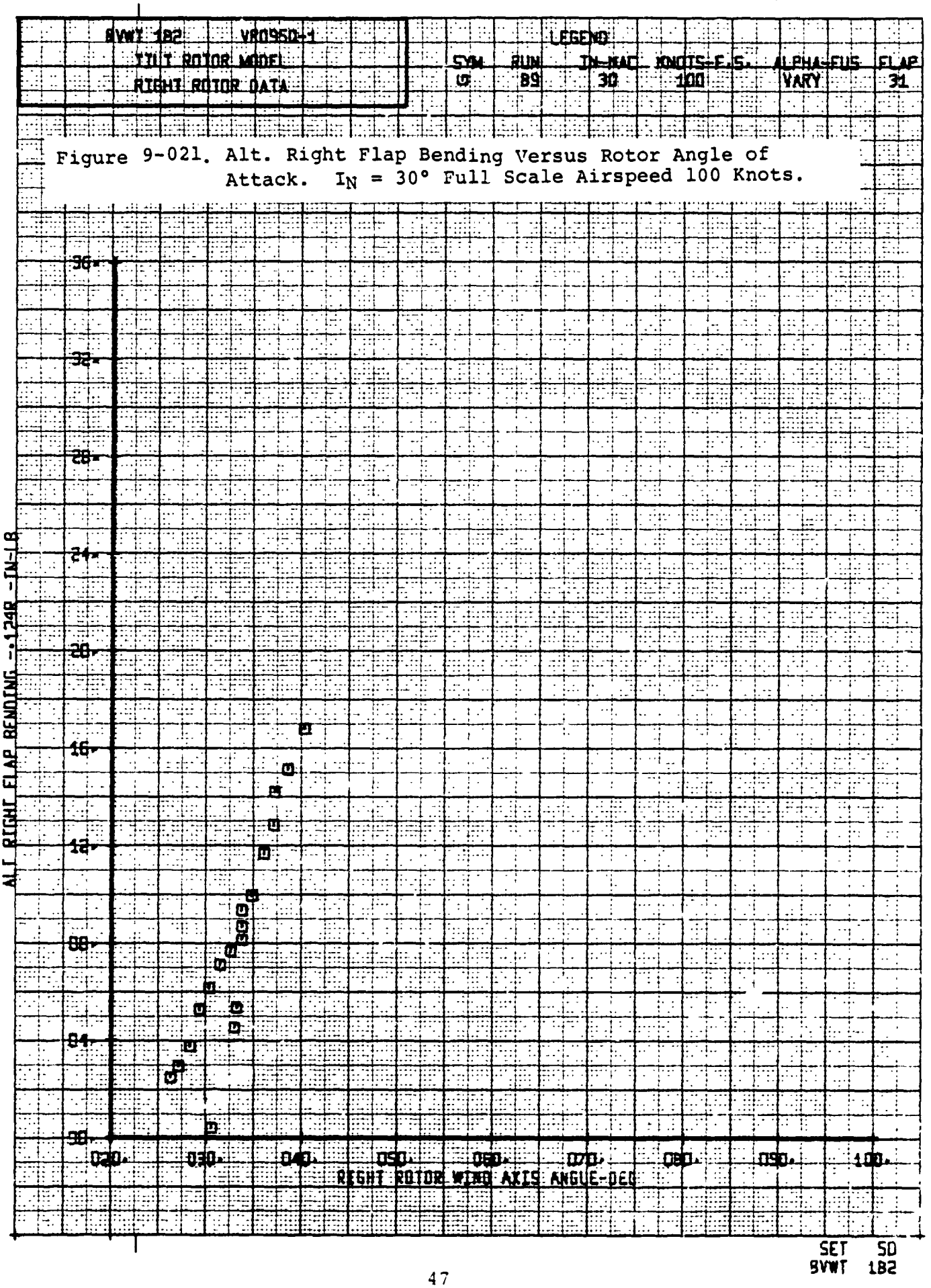

Figure 9-021. Alt. Right Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

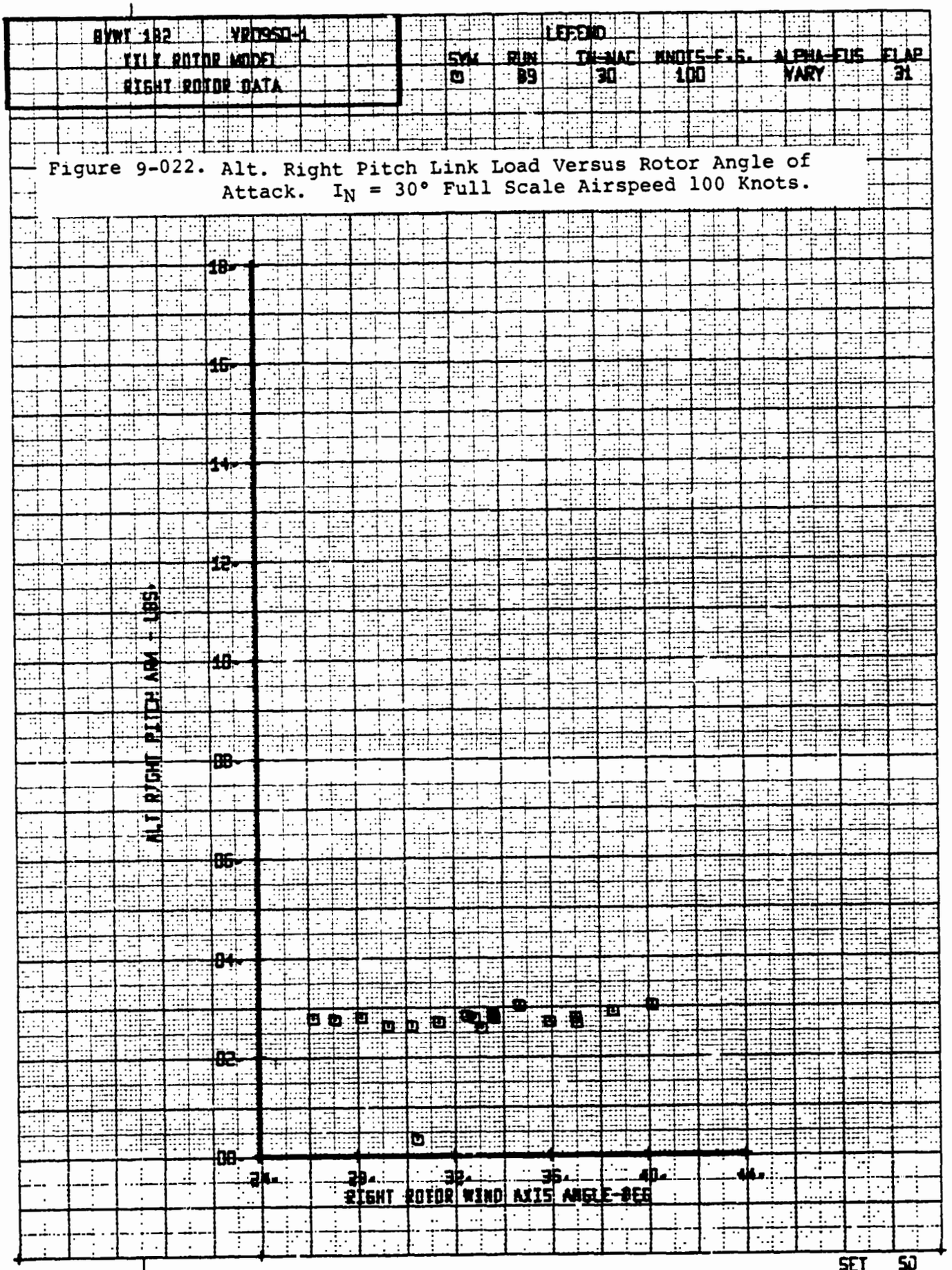

Figure 9-022. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 100 Knots.

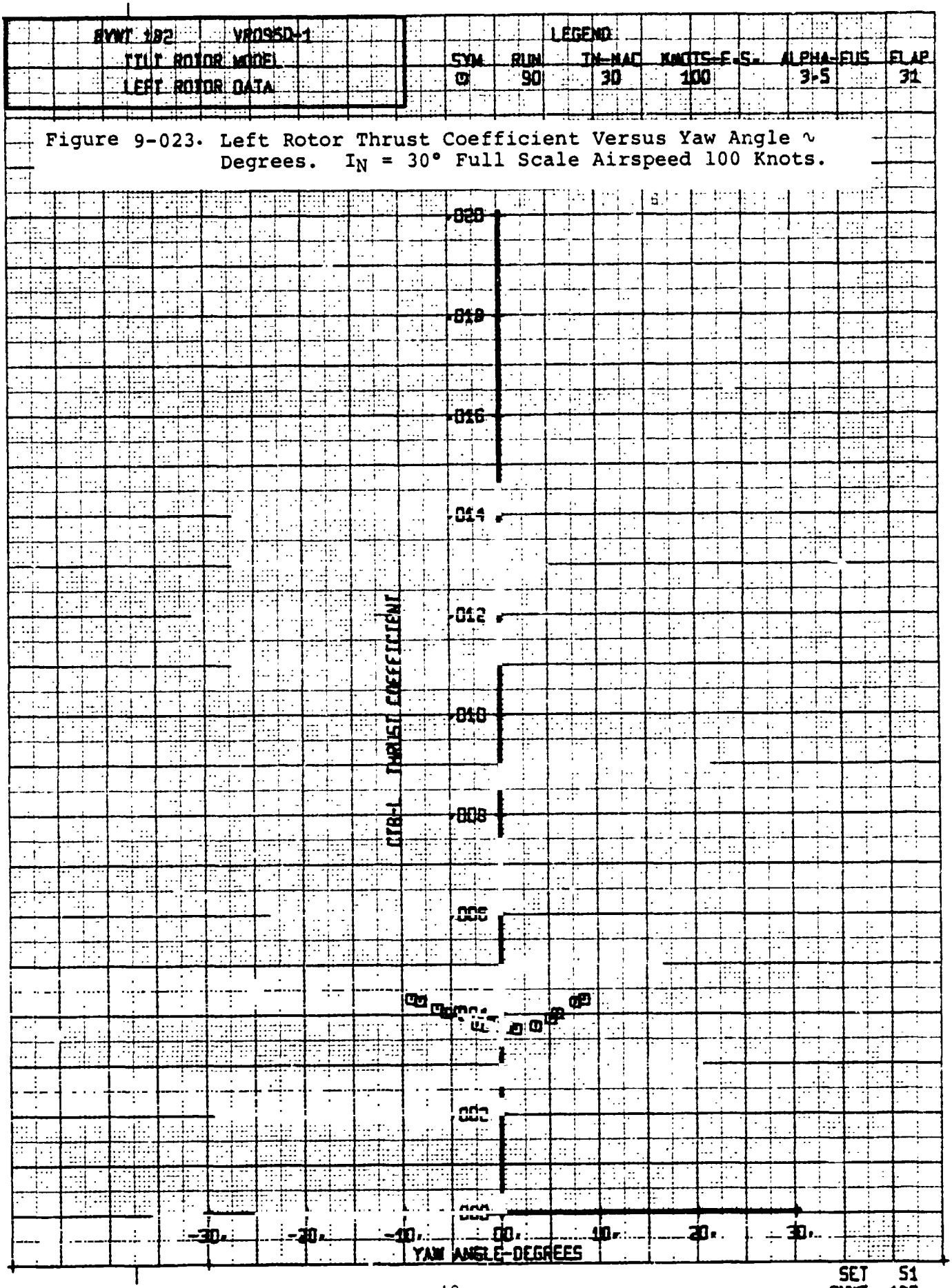

Figure 9-023. Left Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

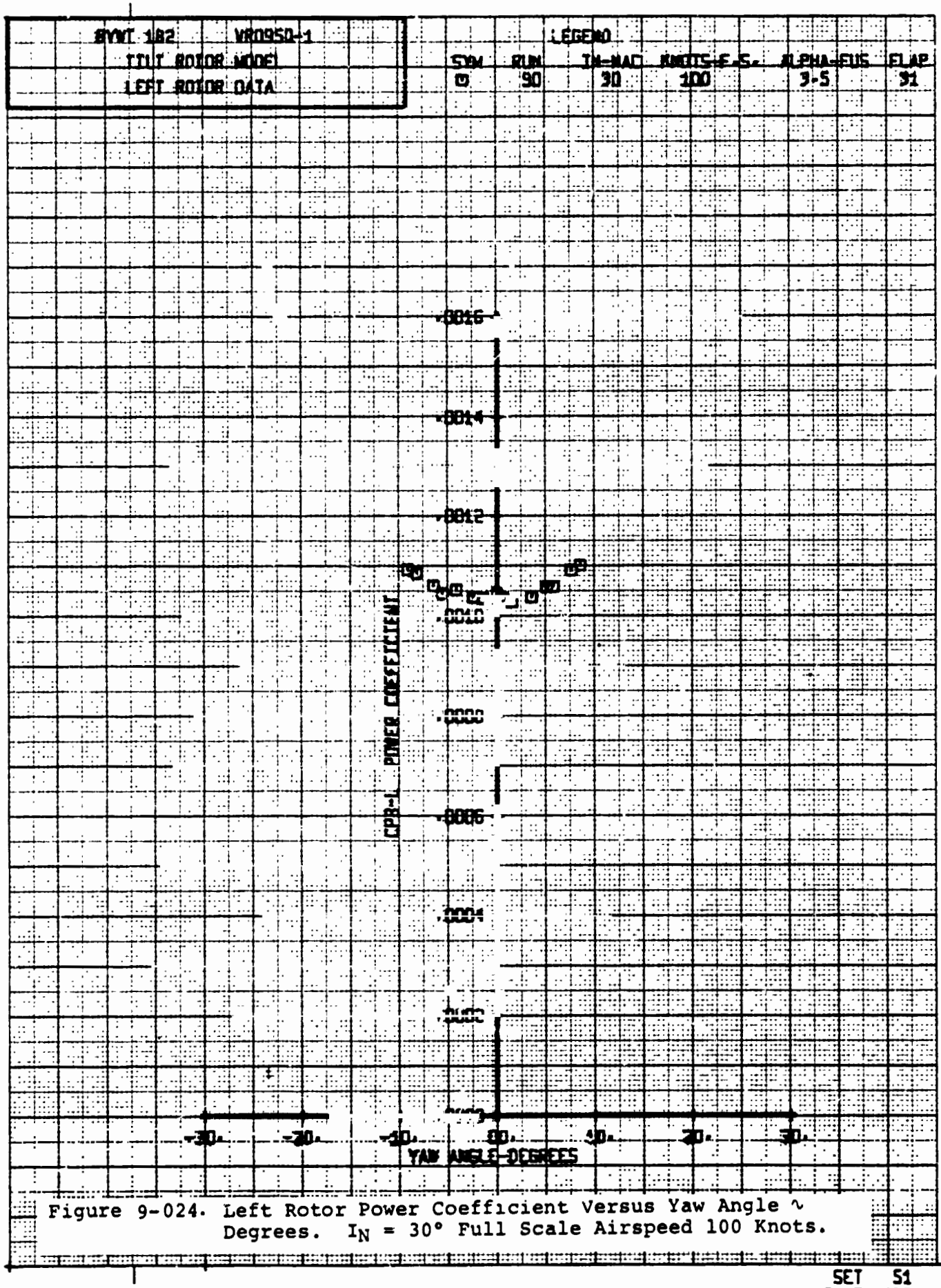

Figure 9-024. Left Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

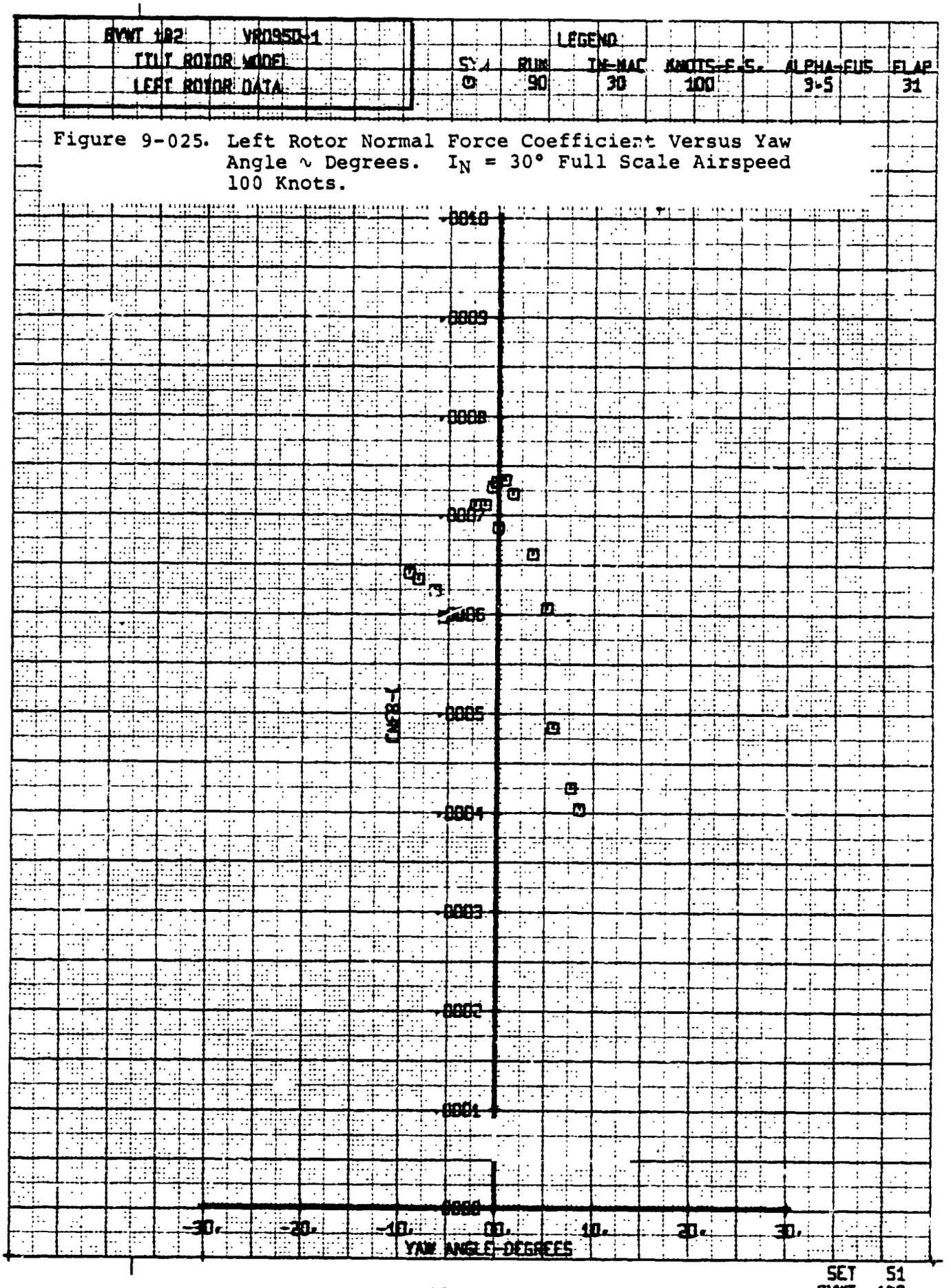

Figure 9-025. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

SET 51
BVWT 182

SET 51
BVWT 182

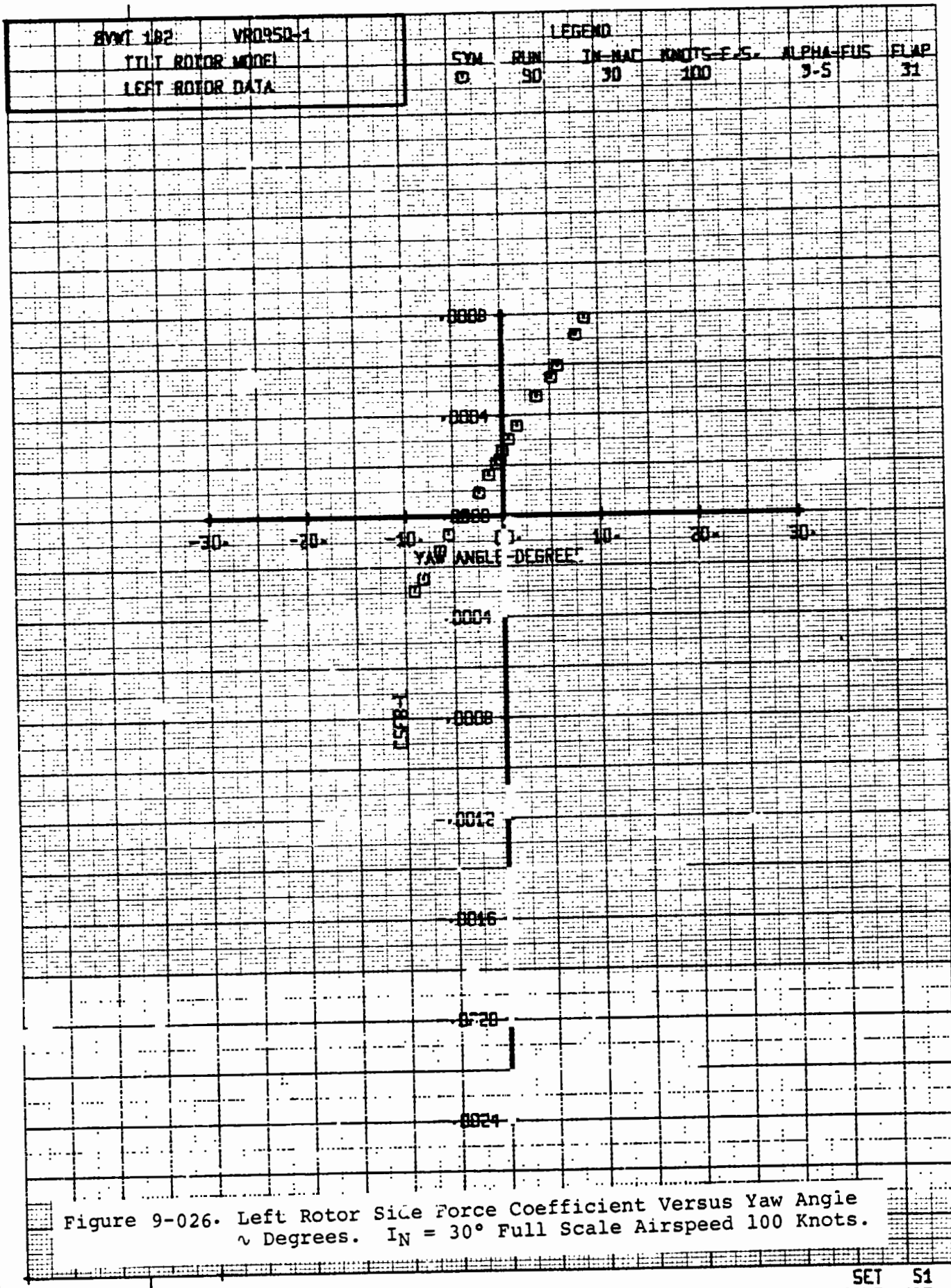

Figure 9-026. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

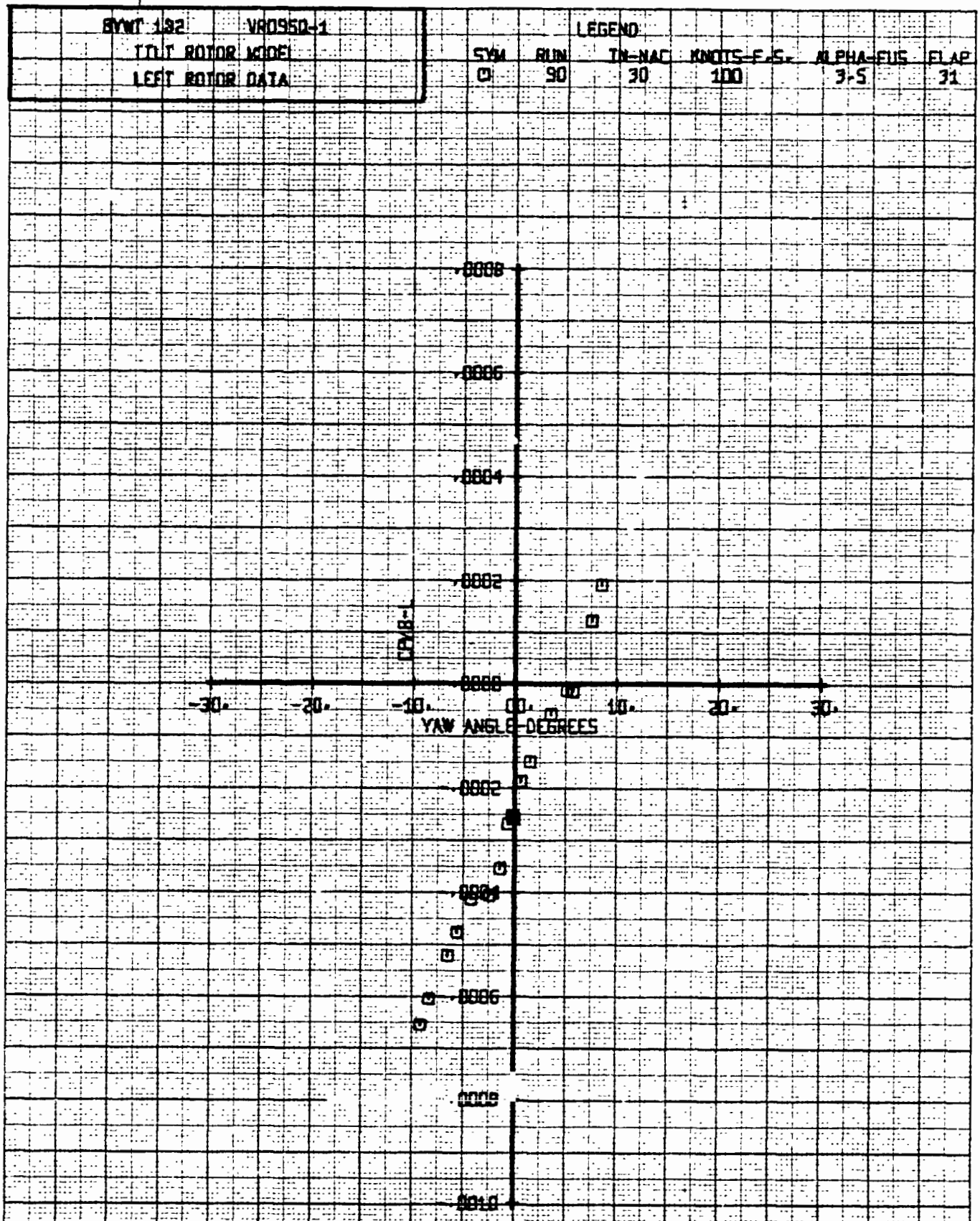

Figure 9-027. Left Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

SET 51
BVWT 182

SET 51
BVWT 182

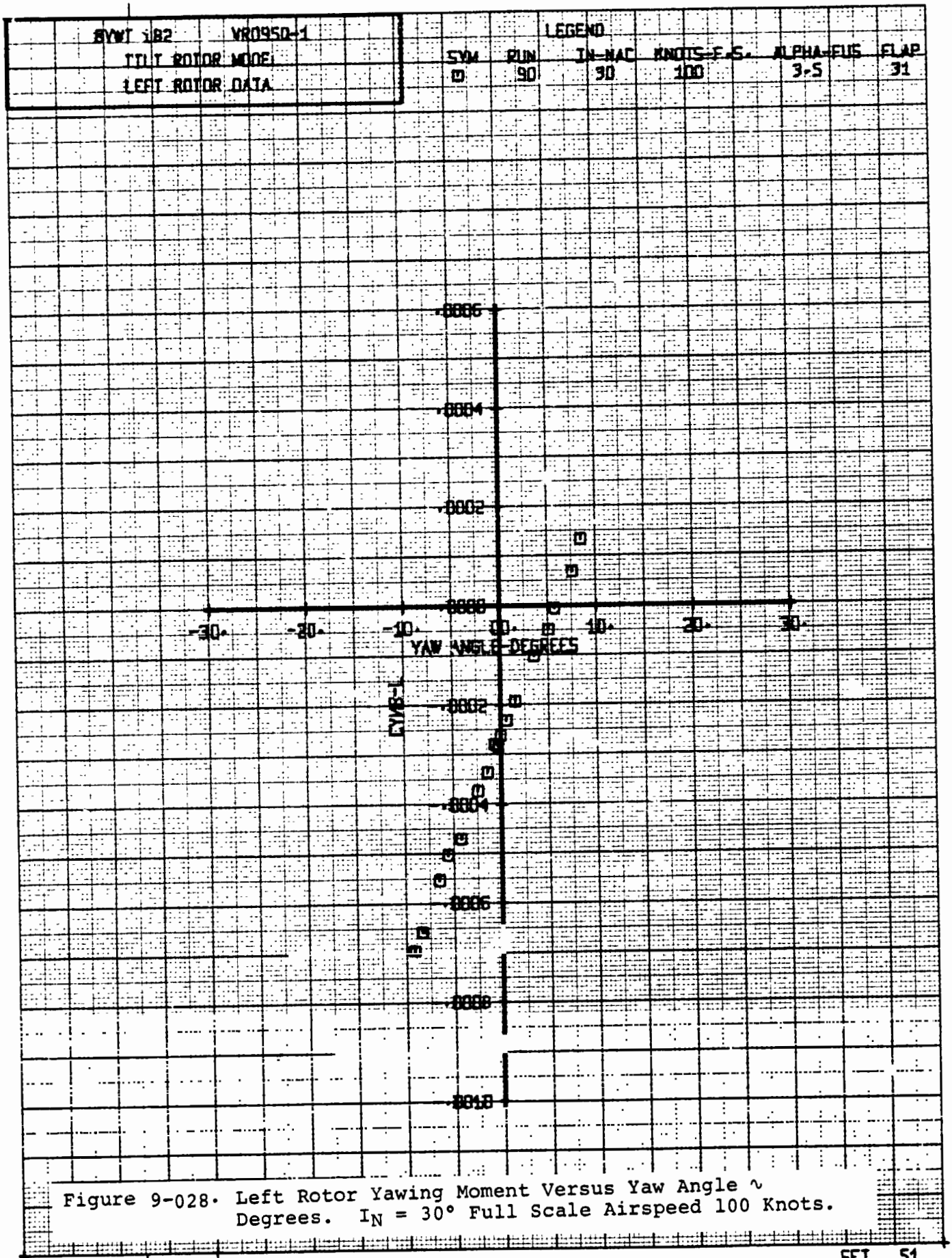

Figure 9-028. Left Rotor Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

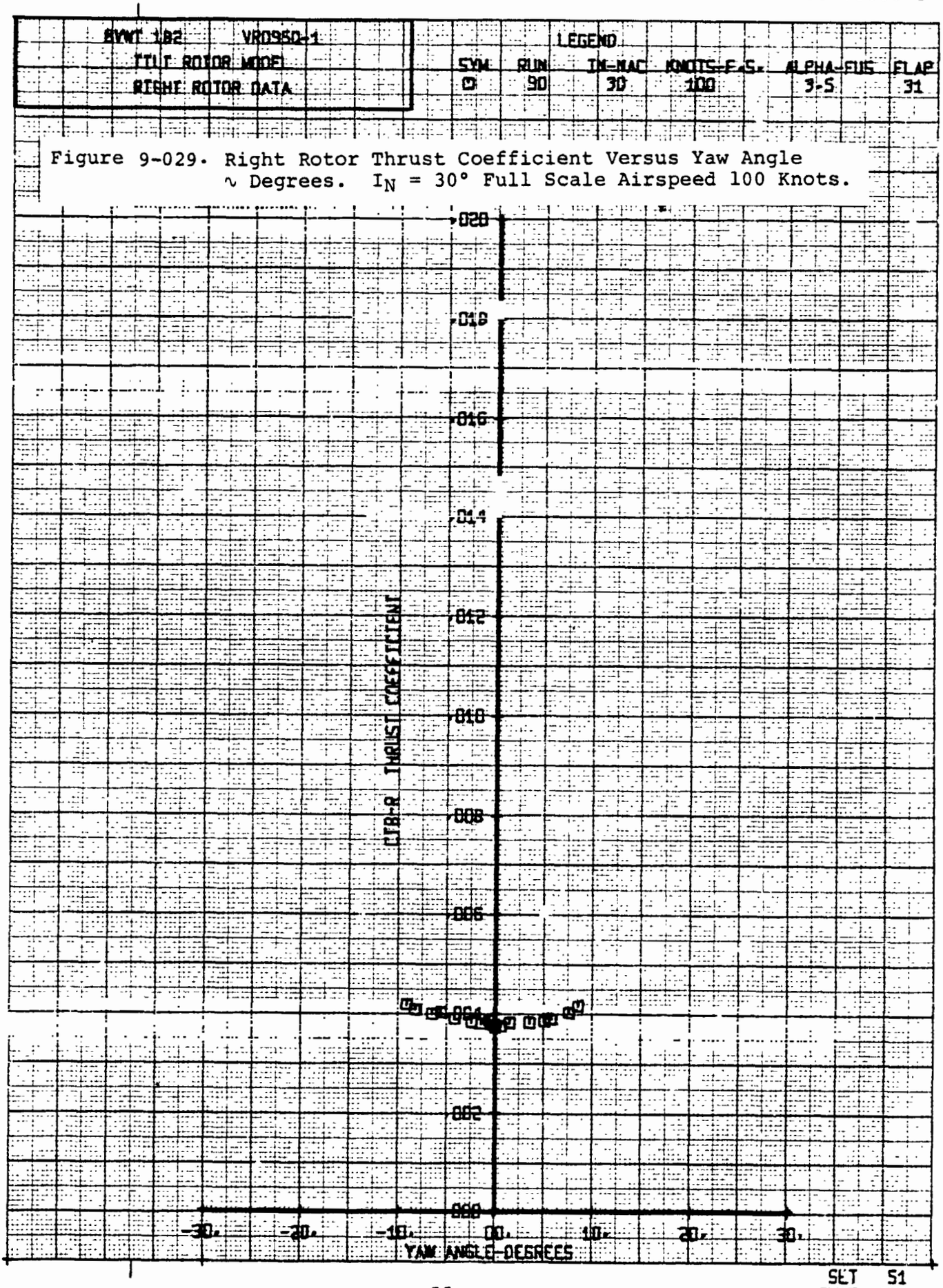

Figure 9-029. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

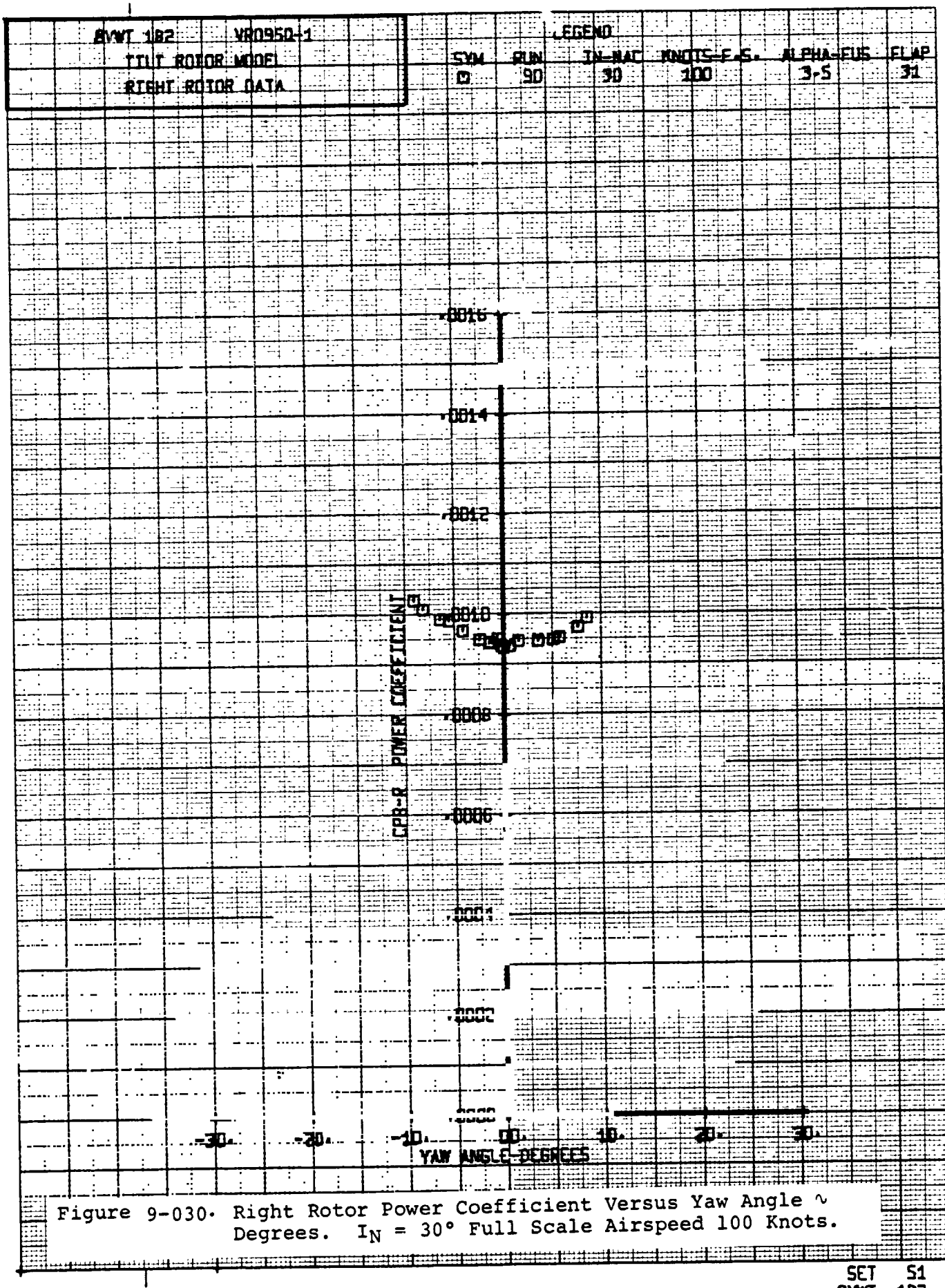

Figure 9-030. Right Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

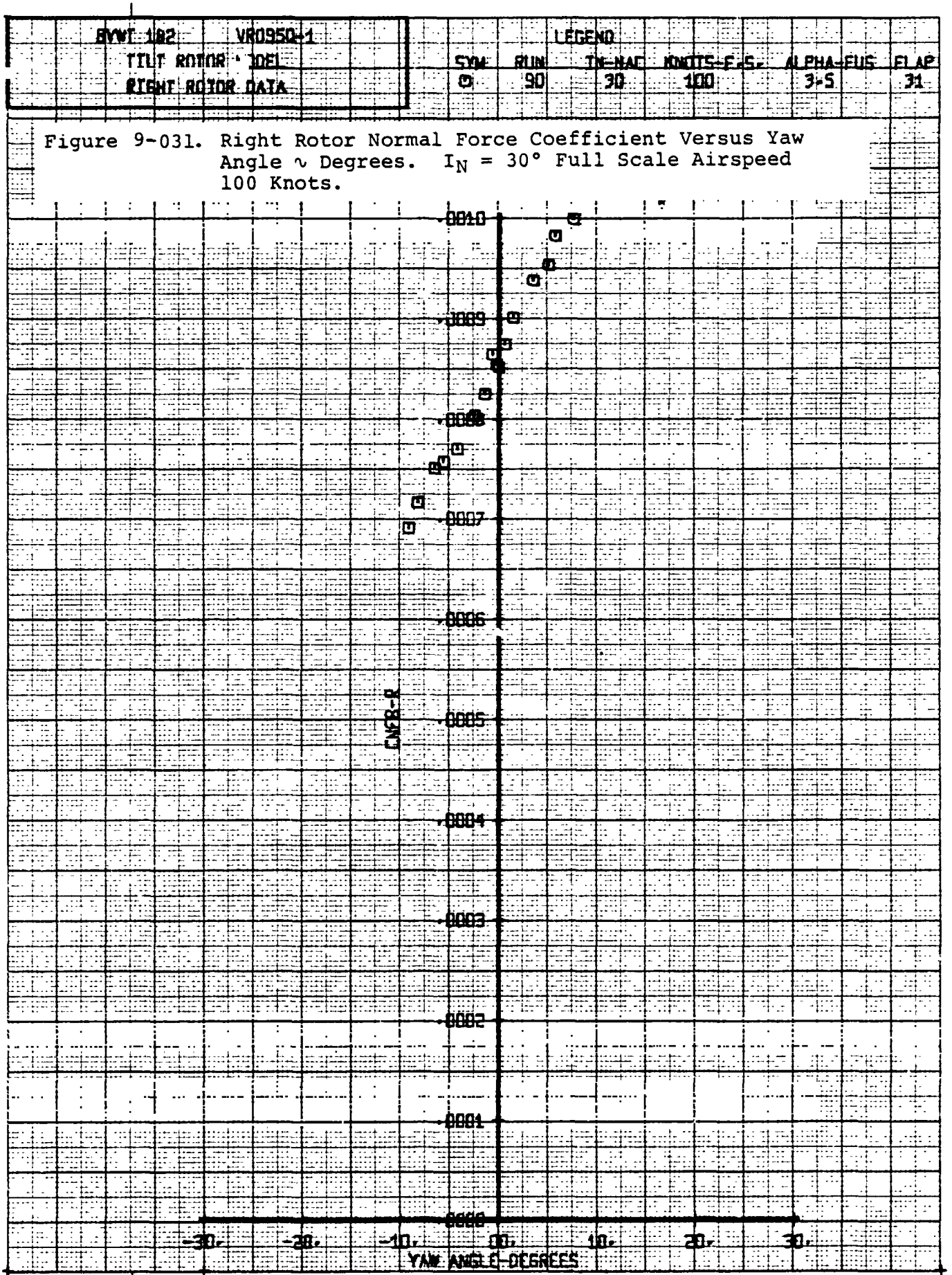

Figure 9-031. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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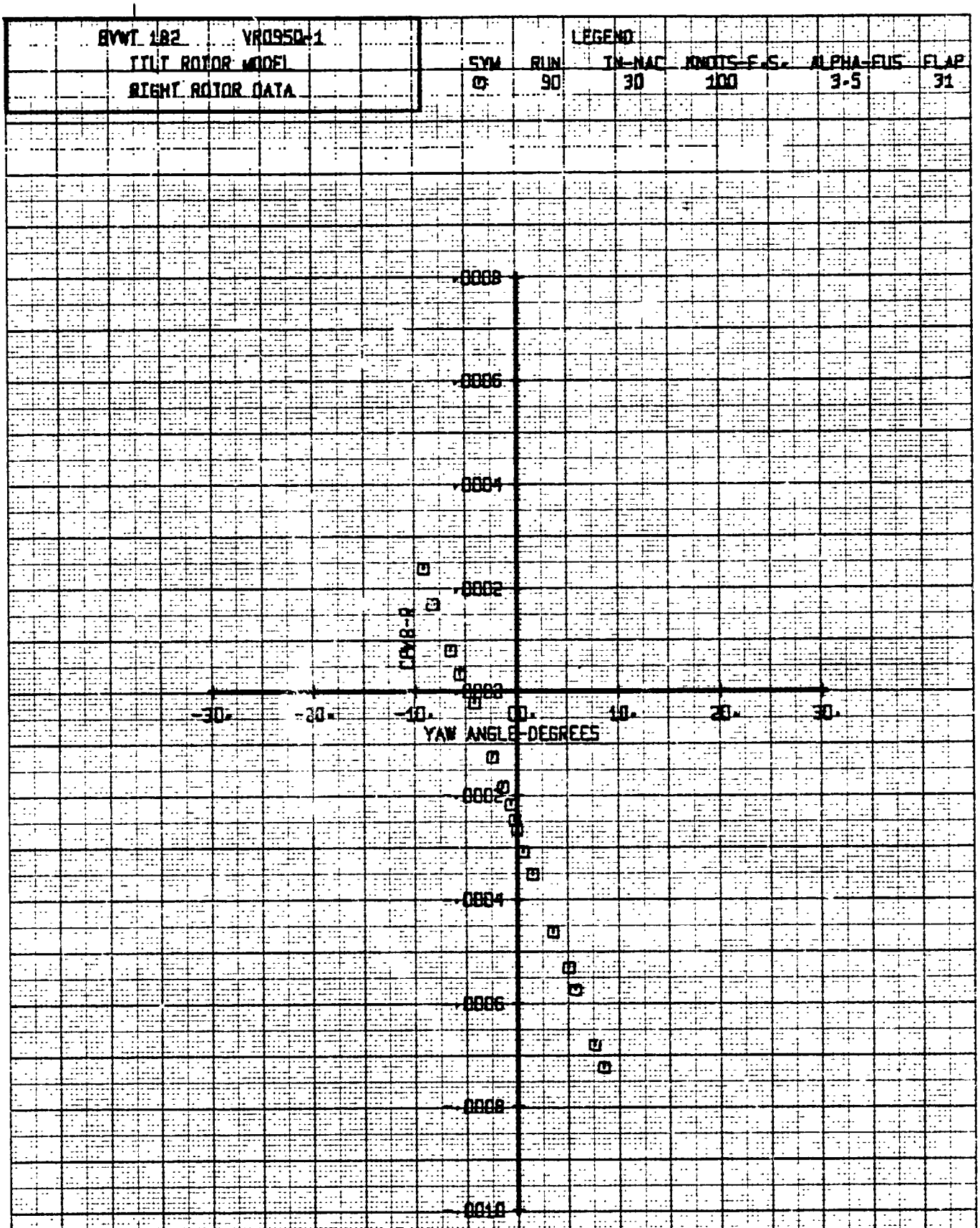

Figure 9-032. Right Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

SET 51
BVWT 182

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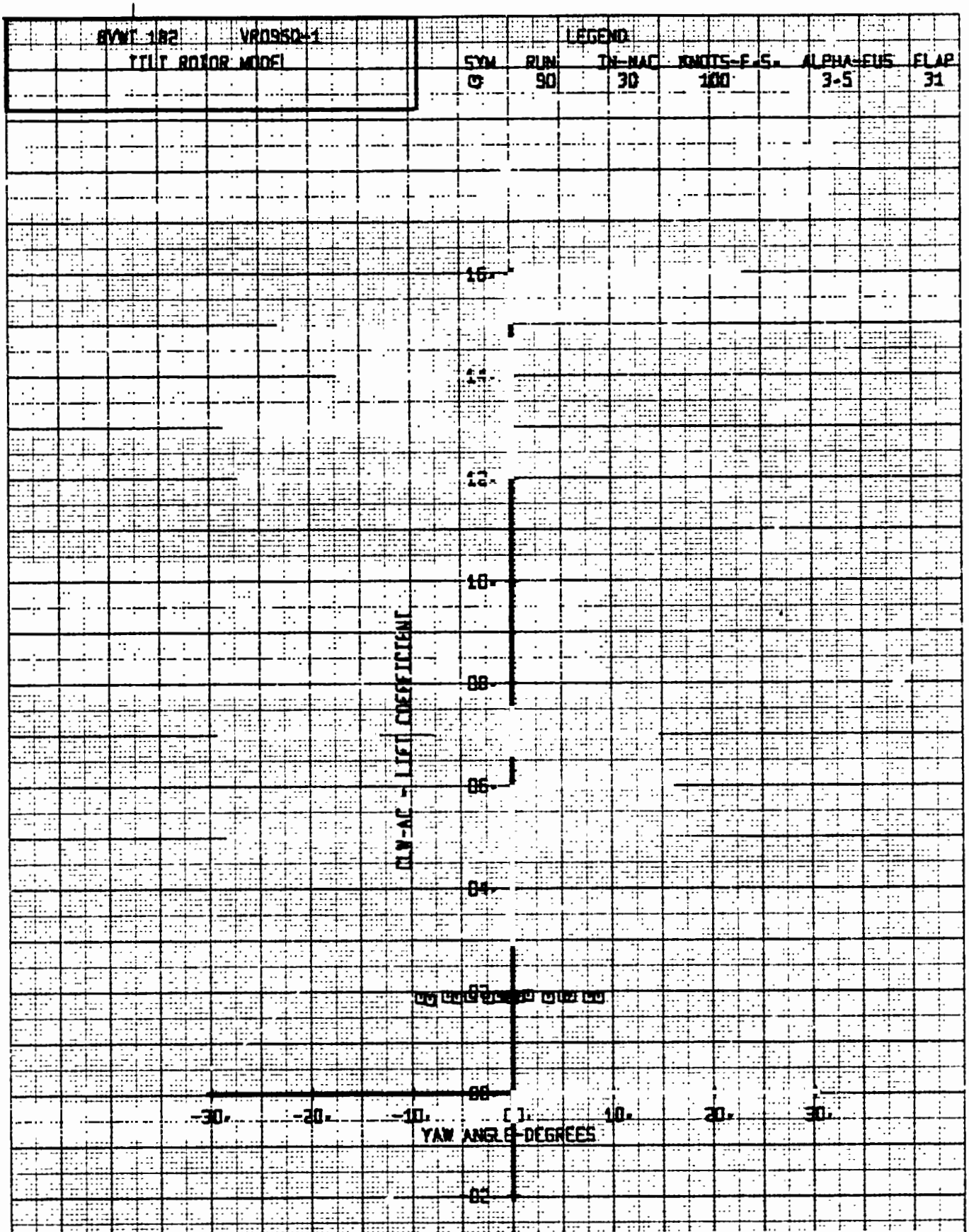

Figure 9-033. Aircraft Lift Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

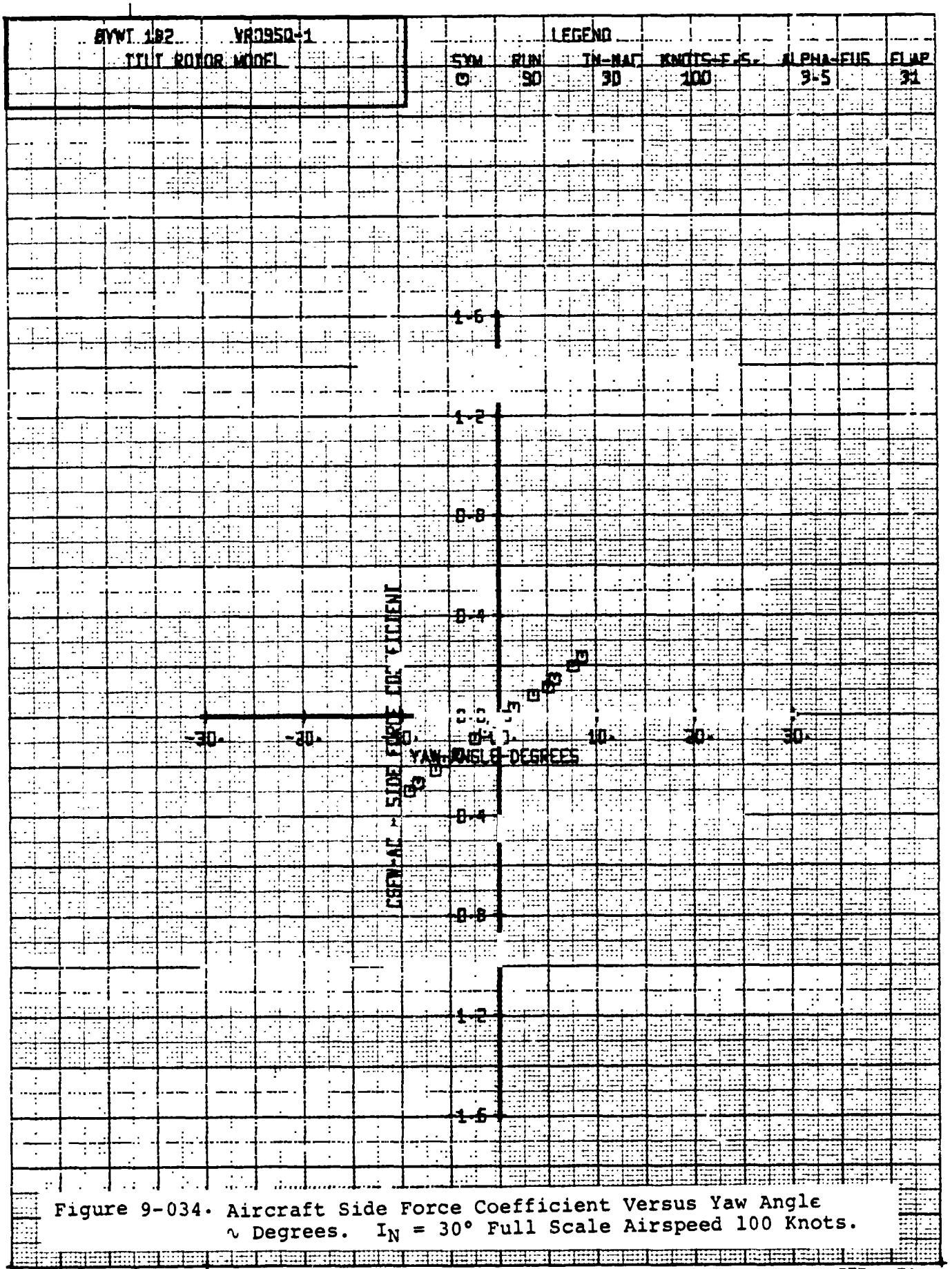

Figure 9-034. Aircraft Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

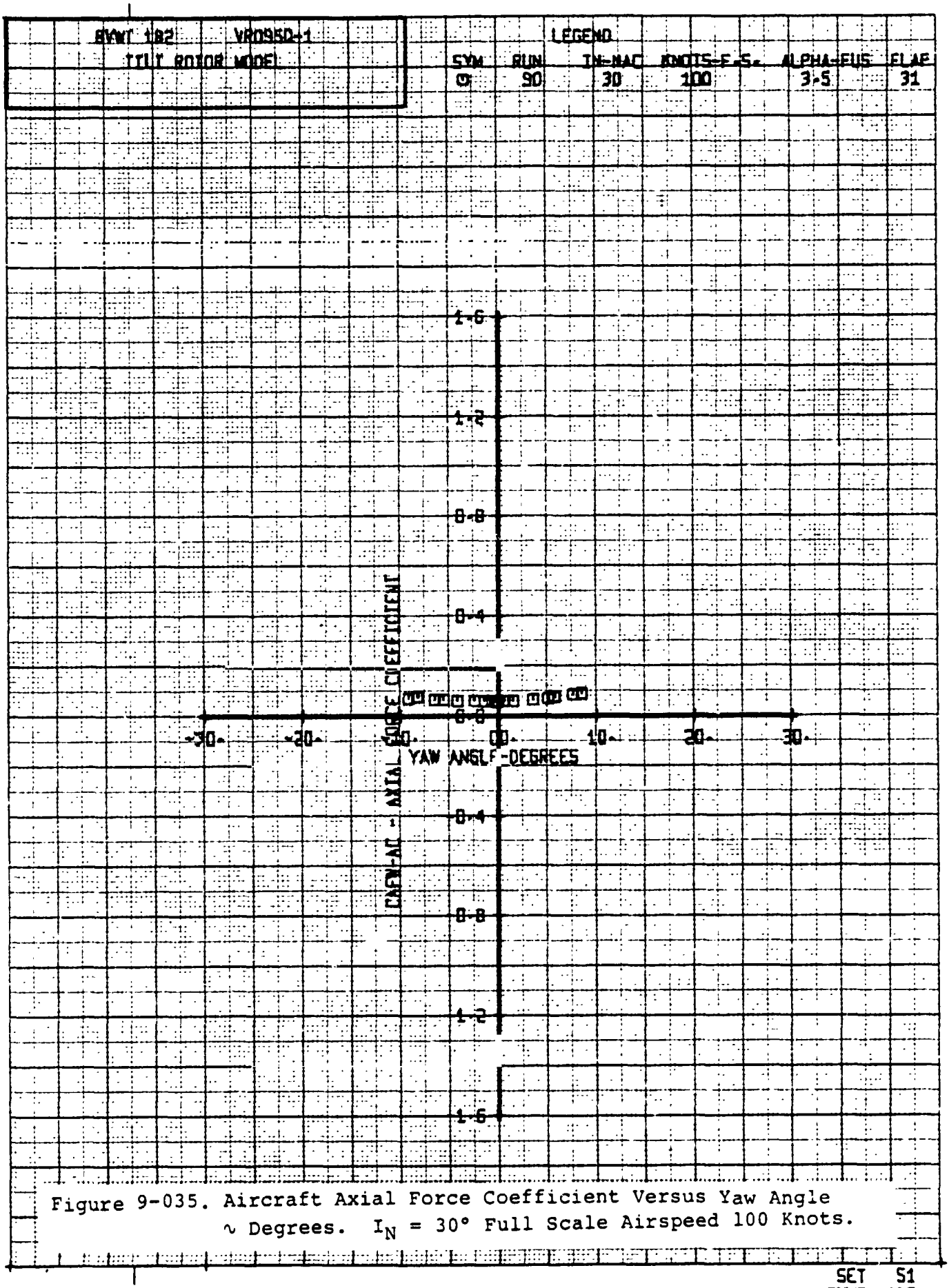

Figure 9-035. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

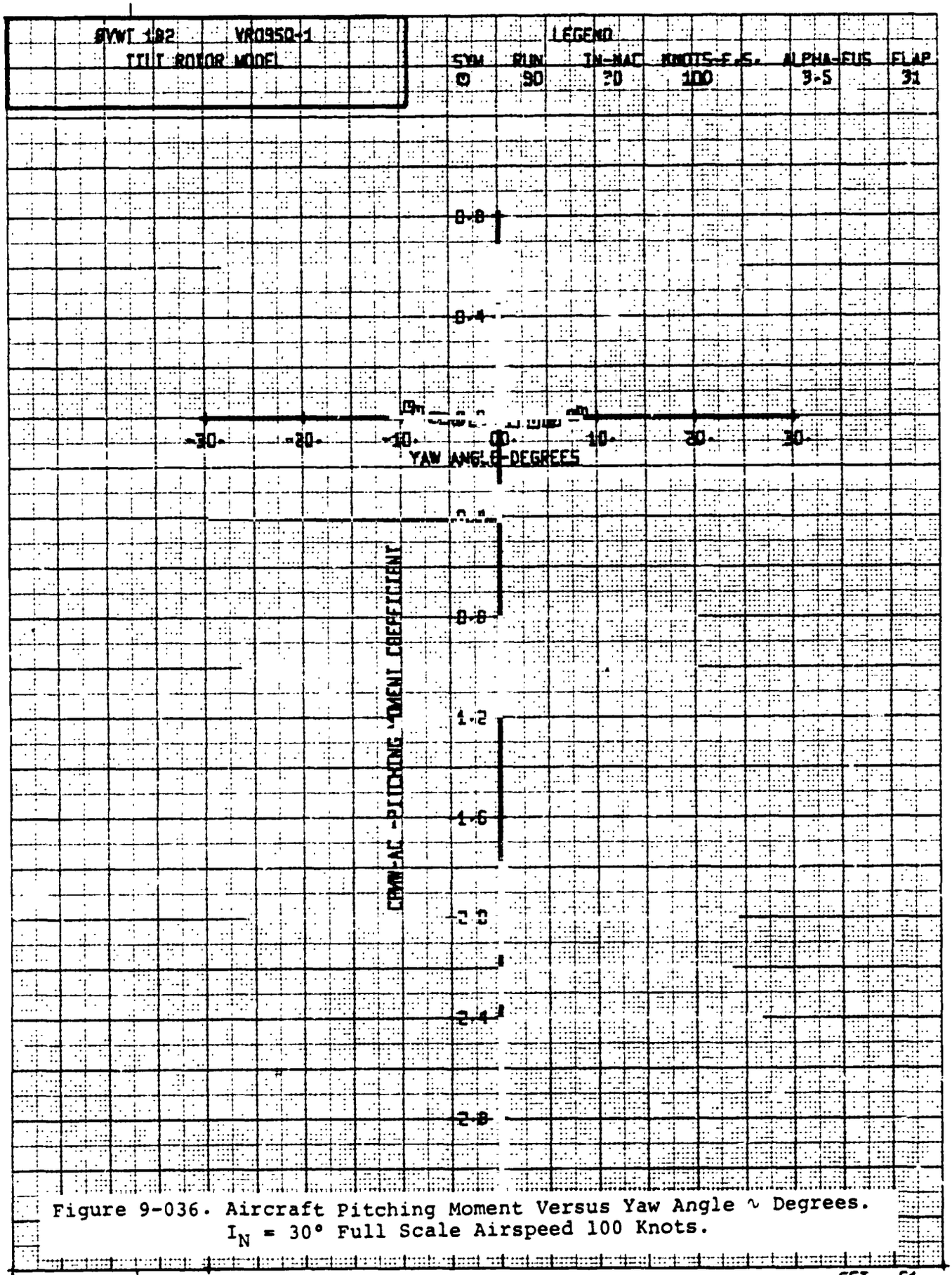

Figure 9-036. Aircraft Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

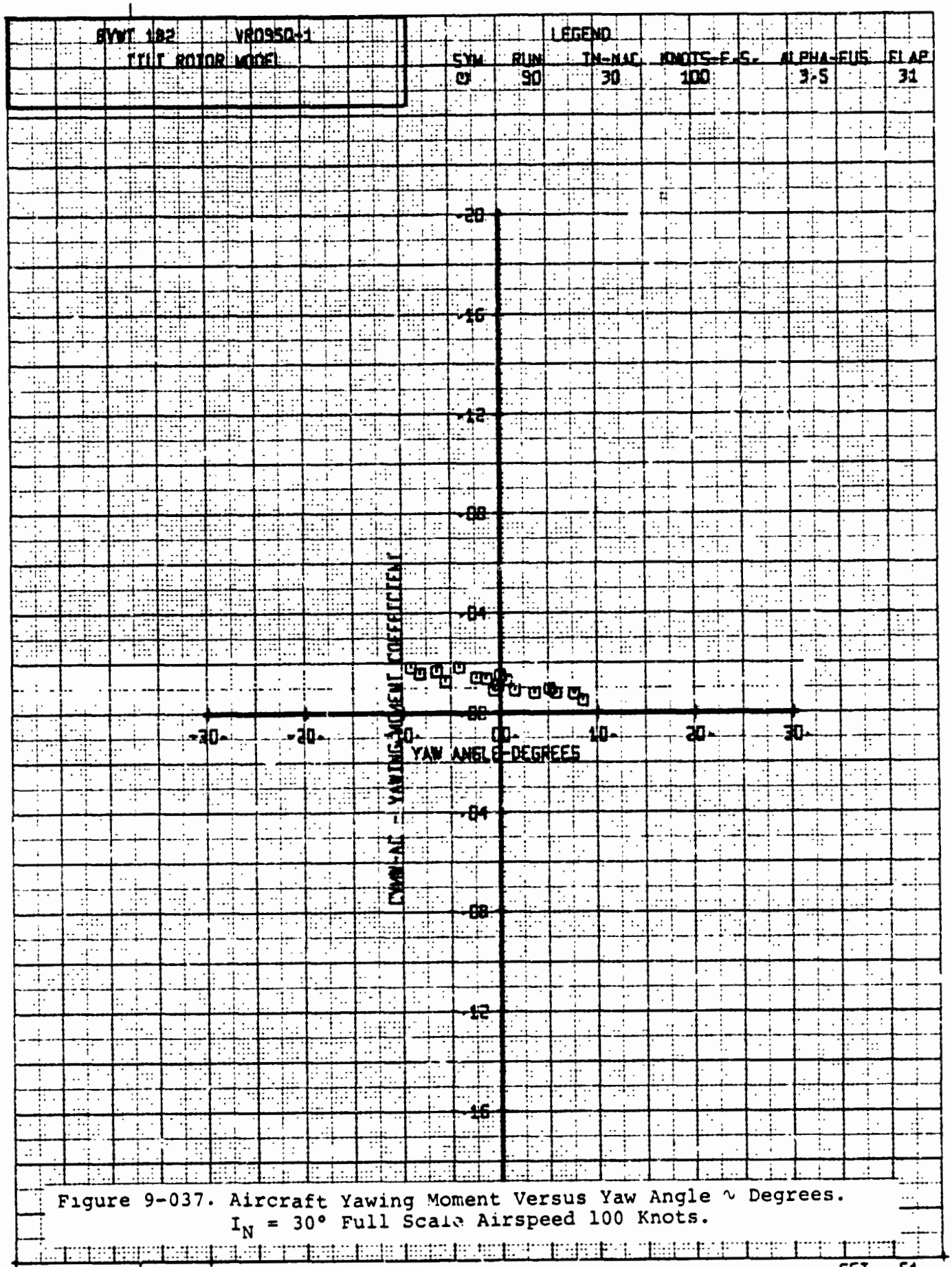

Figure 9-037. Aircraft Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

SET 51
BVWT 182

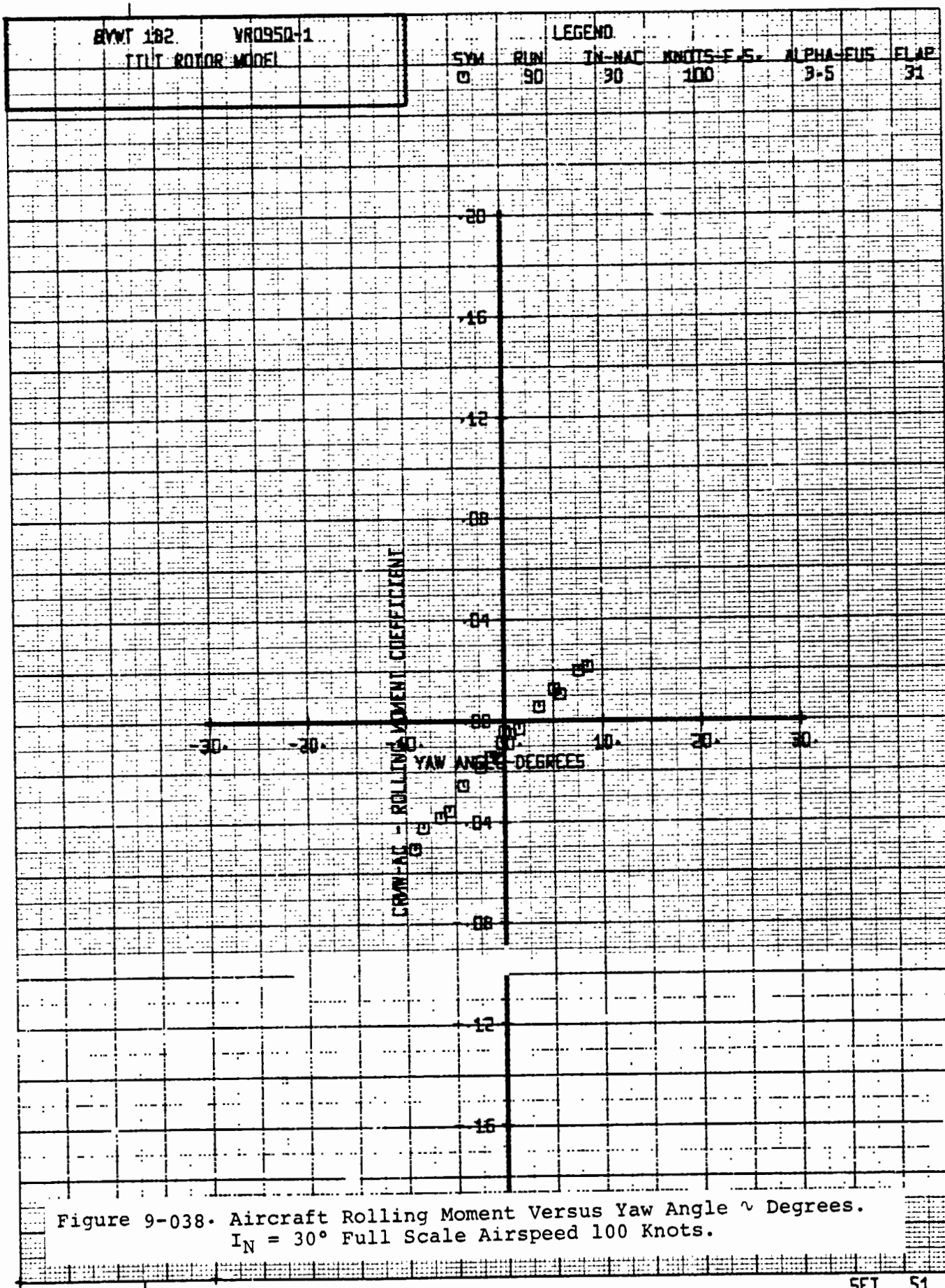

Figure 9-038. Aircraft Rolling Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

51
18

SET 51
BVWT 182

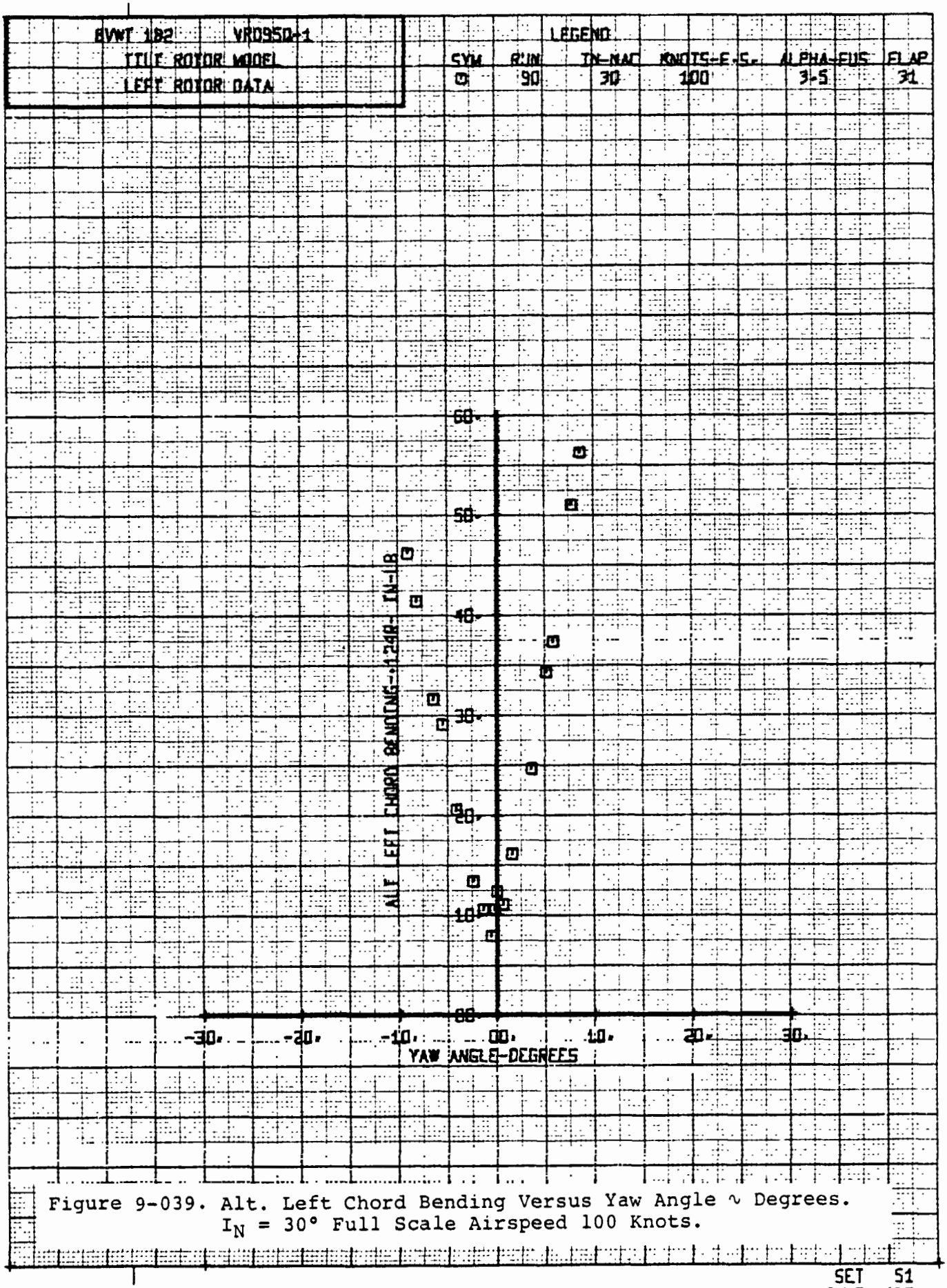

Figure 9-039. Alt. Left Chord Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

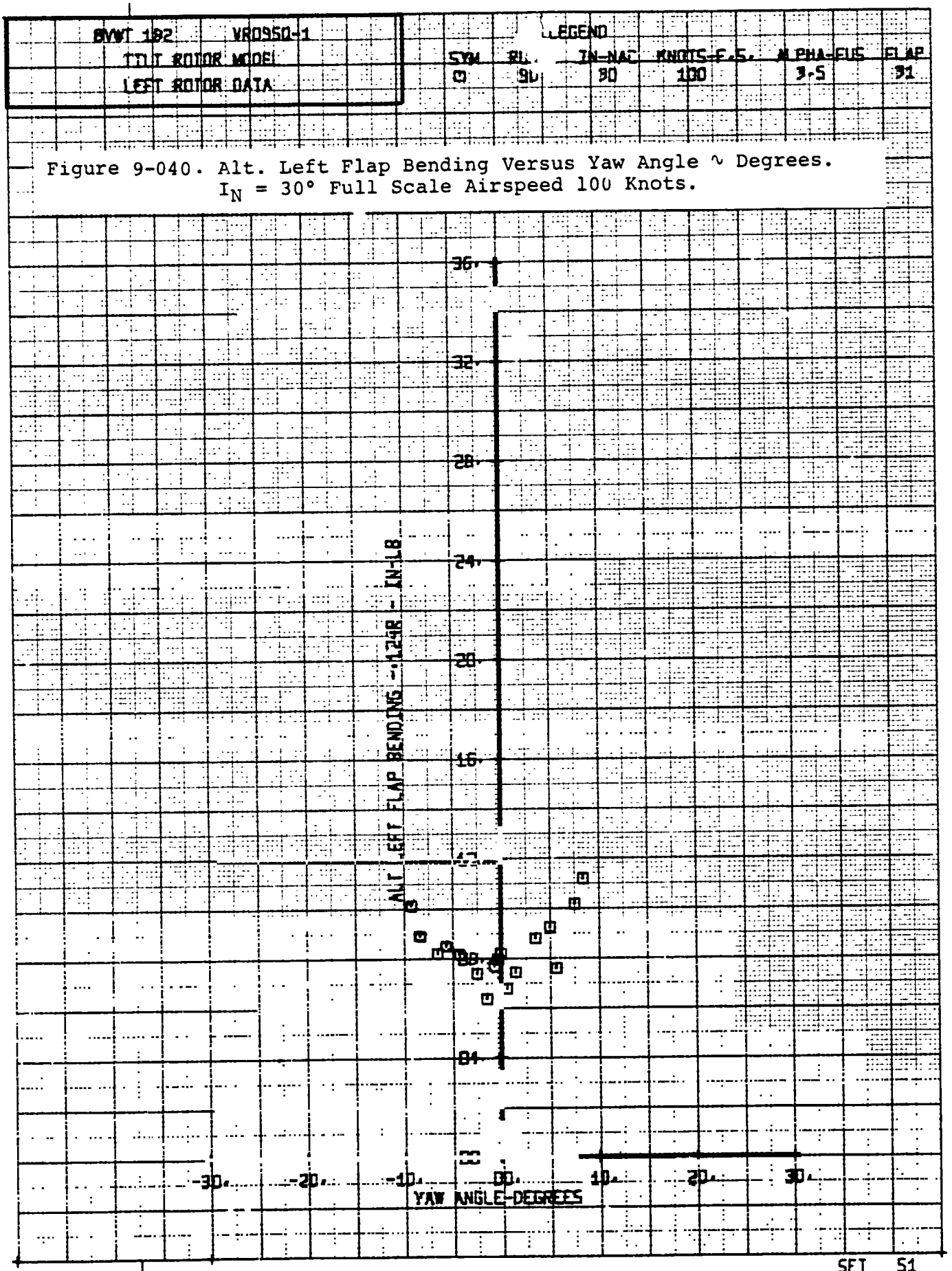

Figure 9-040. Alt. Left Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

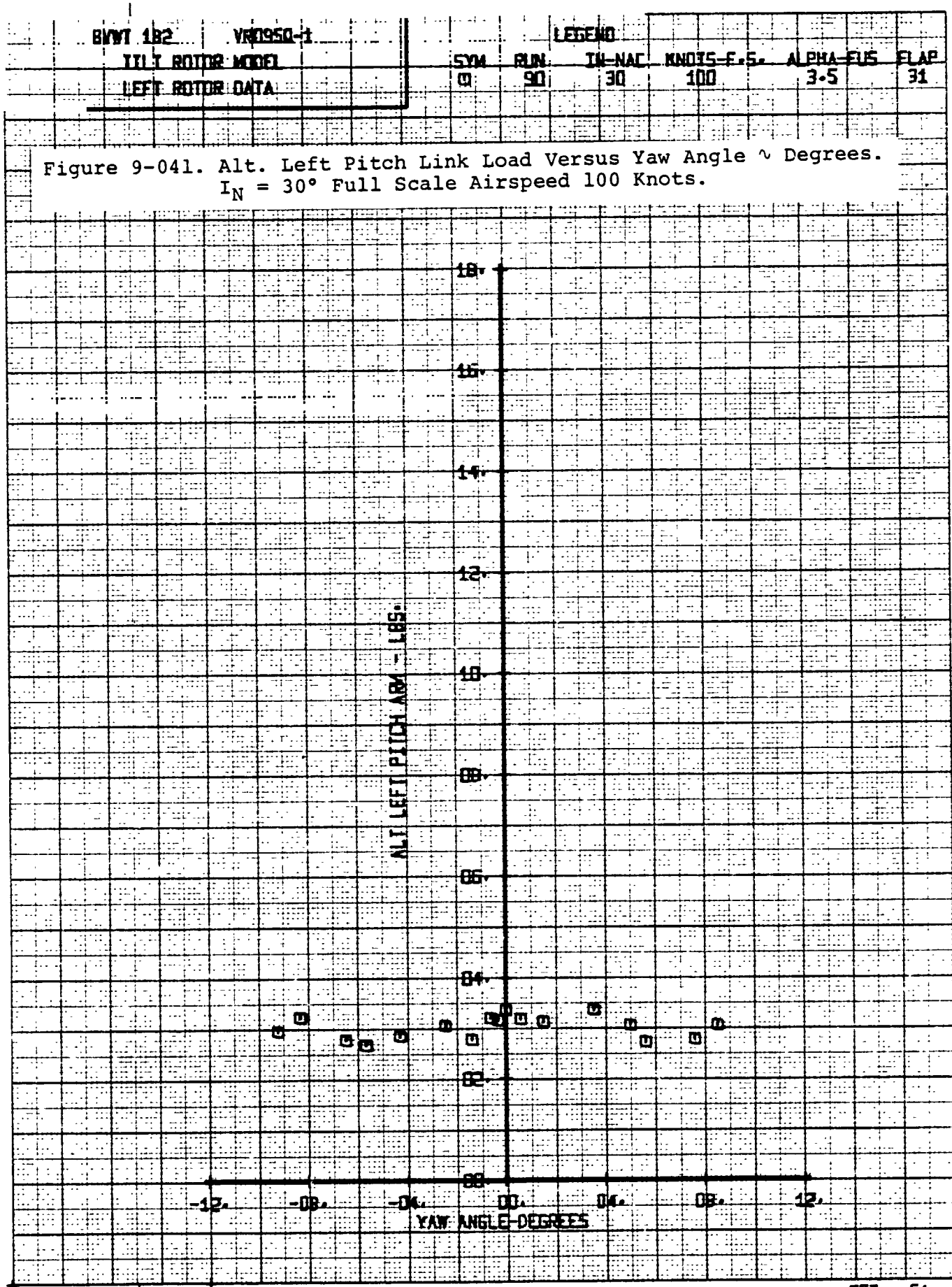

Figure 9-041. Alt. Left Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

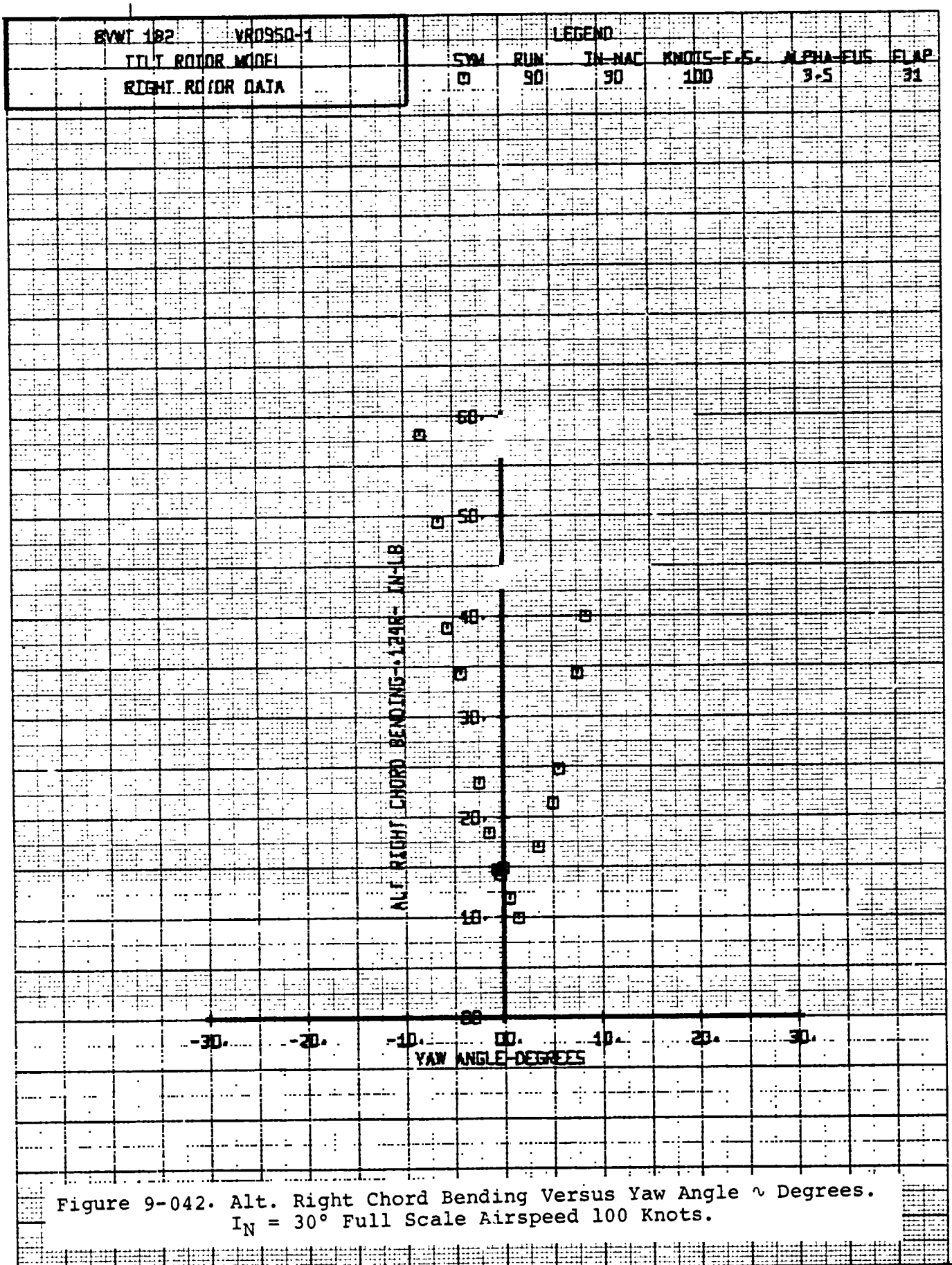

Figure 9-042. Alt. Right Chord Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

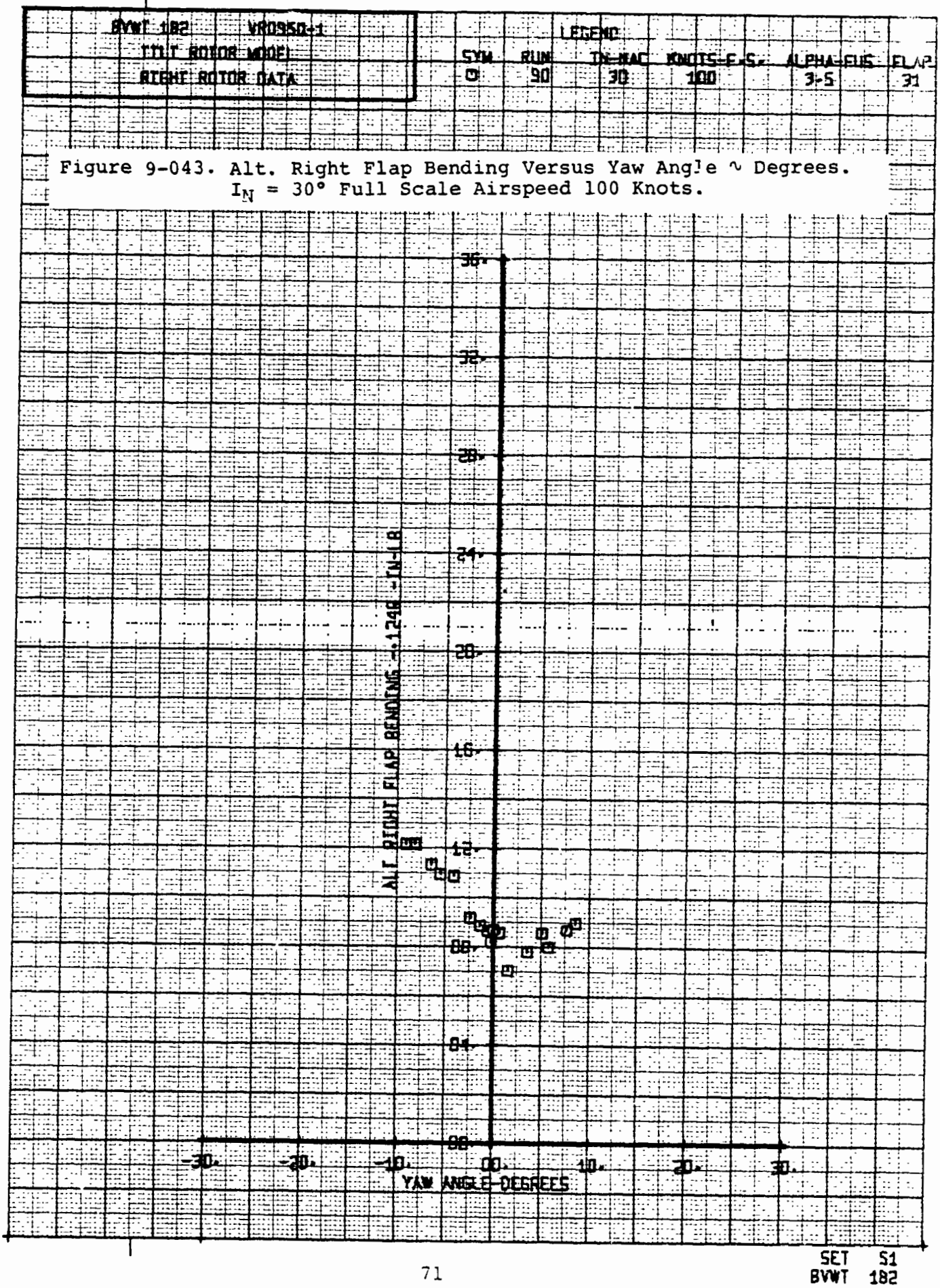

Figure 9-043. Alt. Right Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

ET S1
1 182

SET S1
BVWT 182

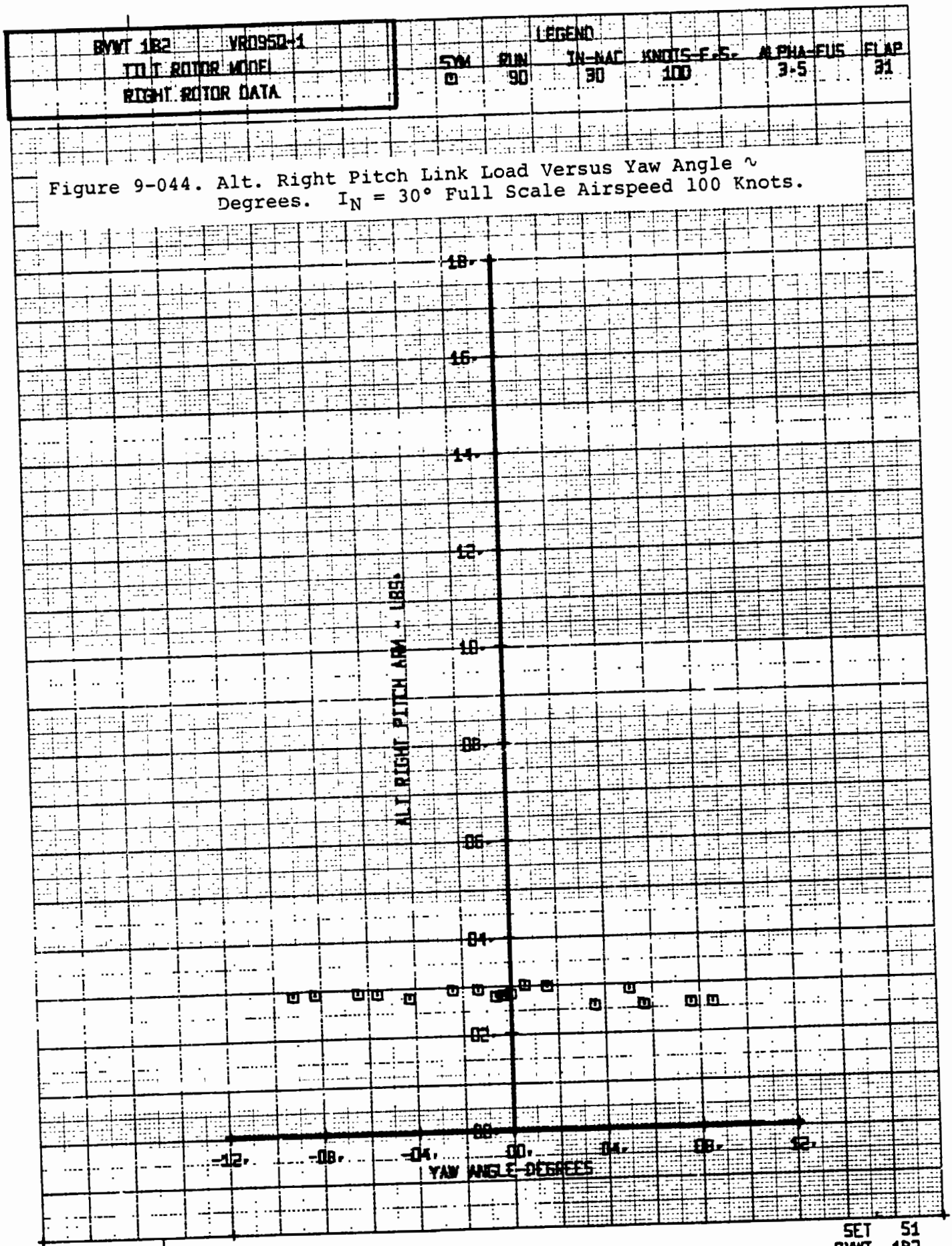

Figure 9-044. Alt. Right Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

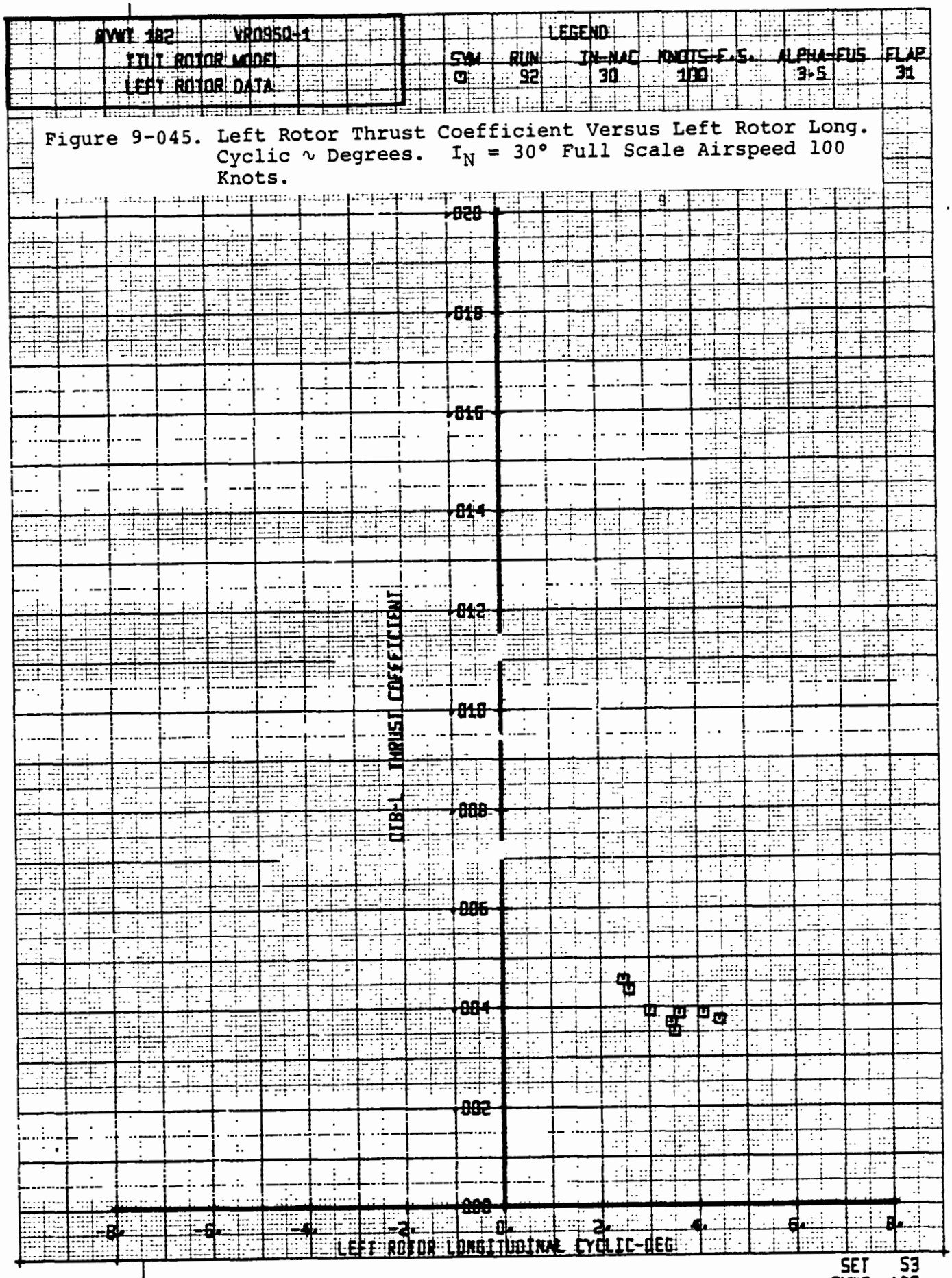

Figure 9-045. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

ET S3
W 182

SET S3
BVWT 182

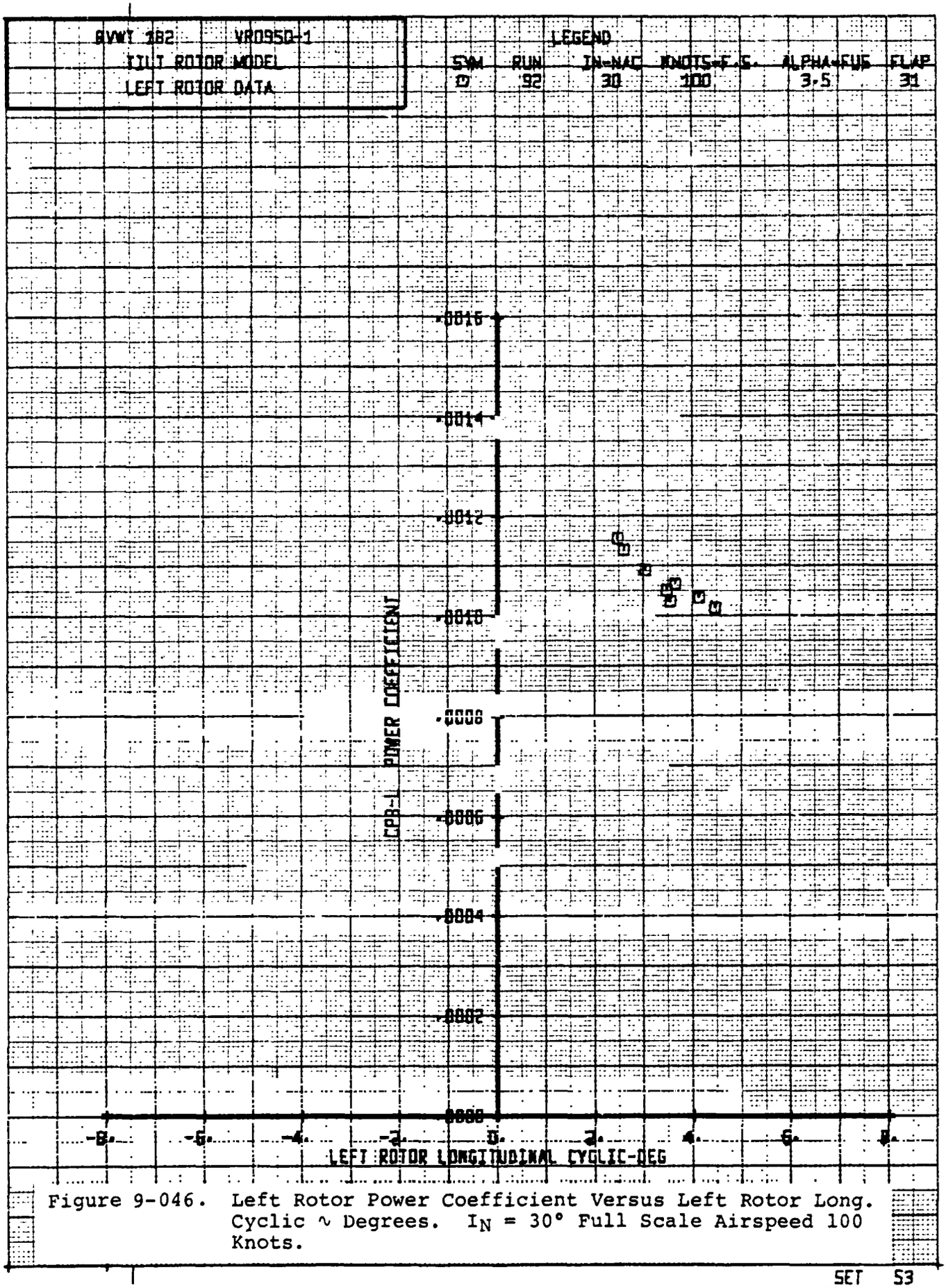

Figure 9-046. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

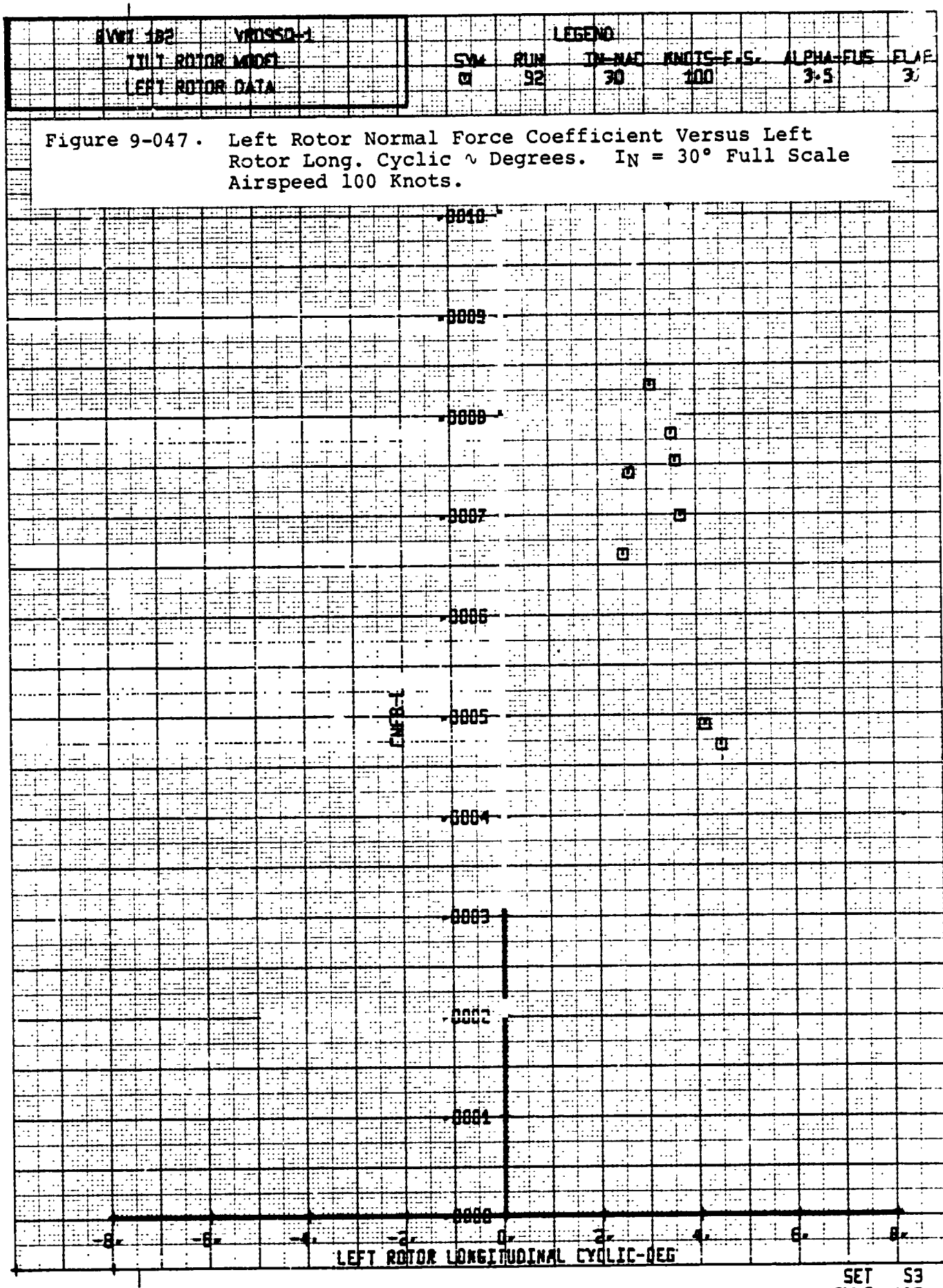

Figure 9-047. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

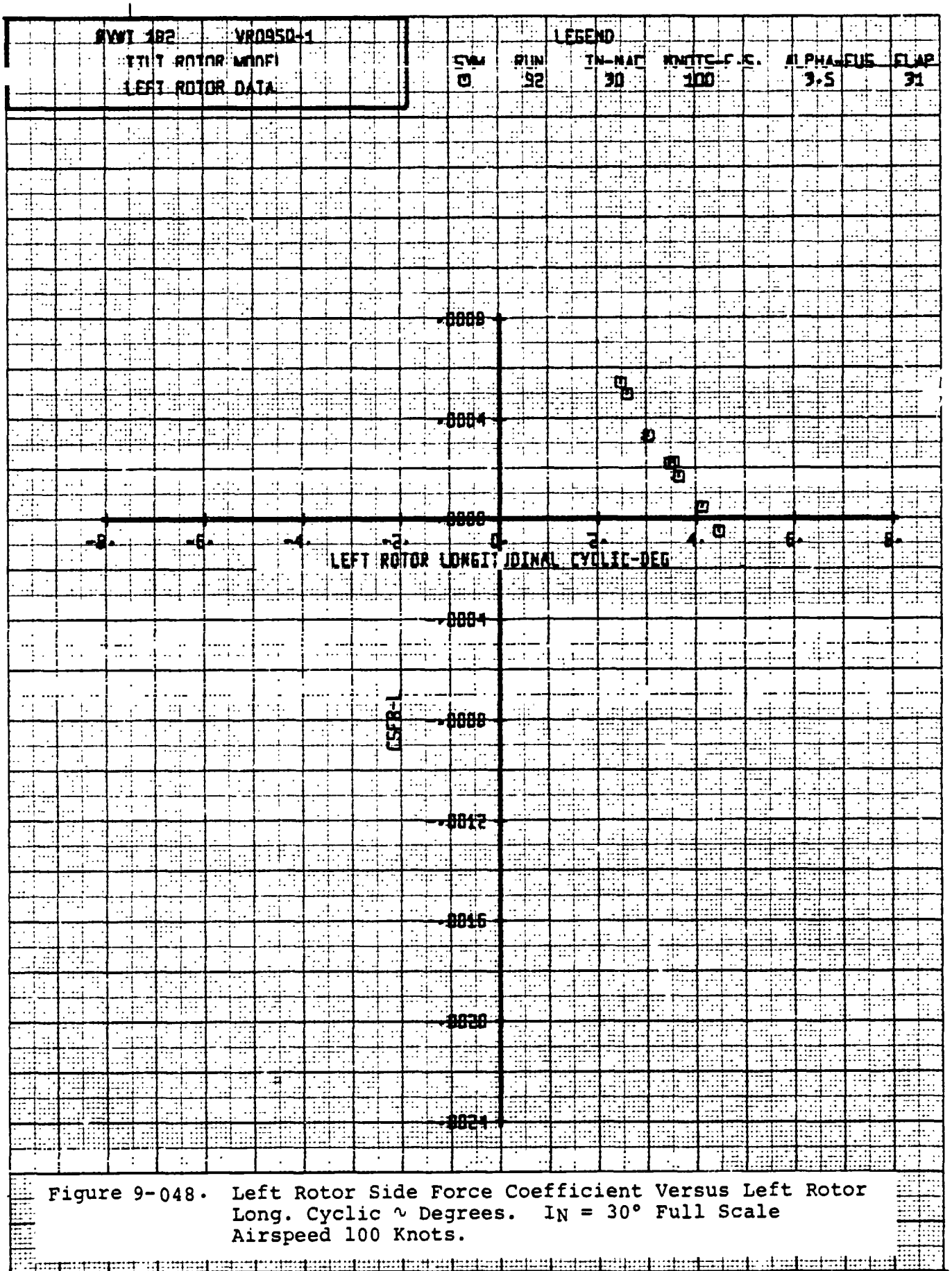

Figure 9-048. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

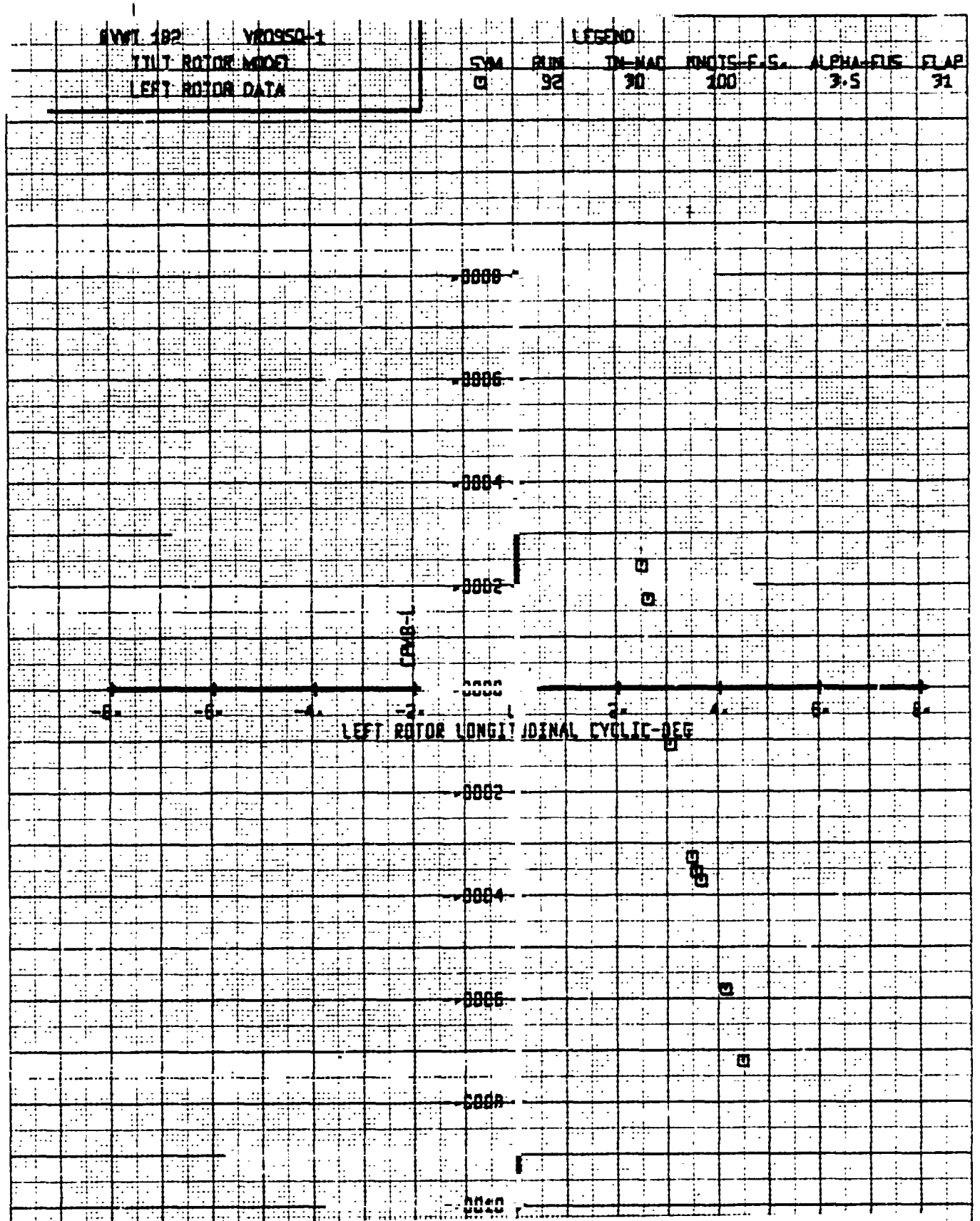

Figure 9-0.9. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

ET S3
182

SET S3
BVWT 182

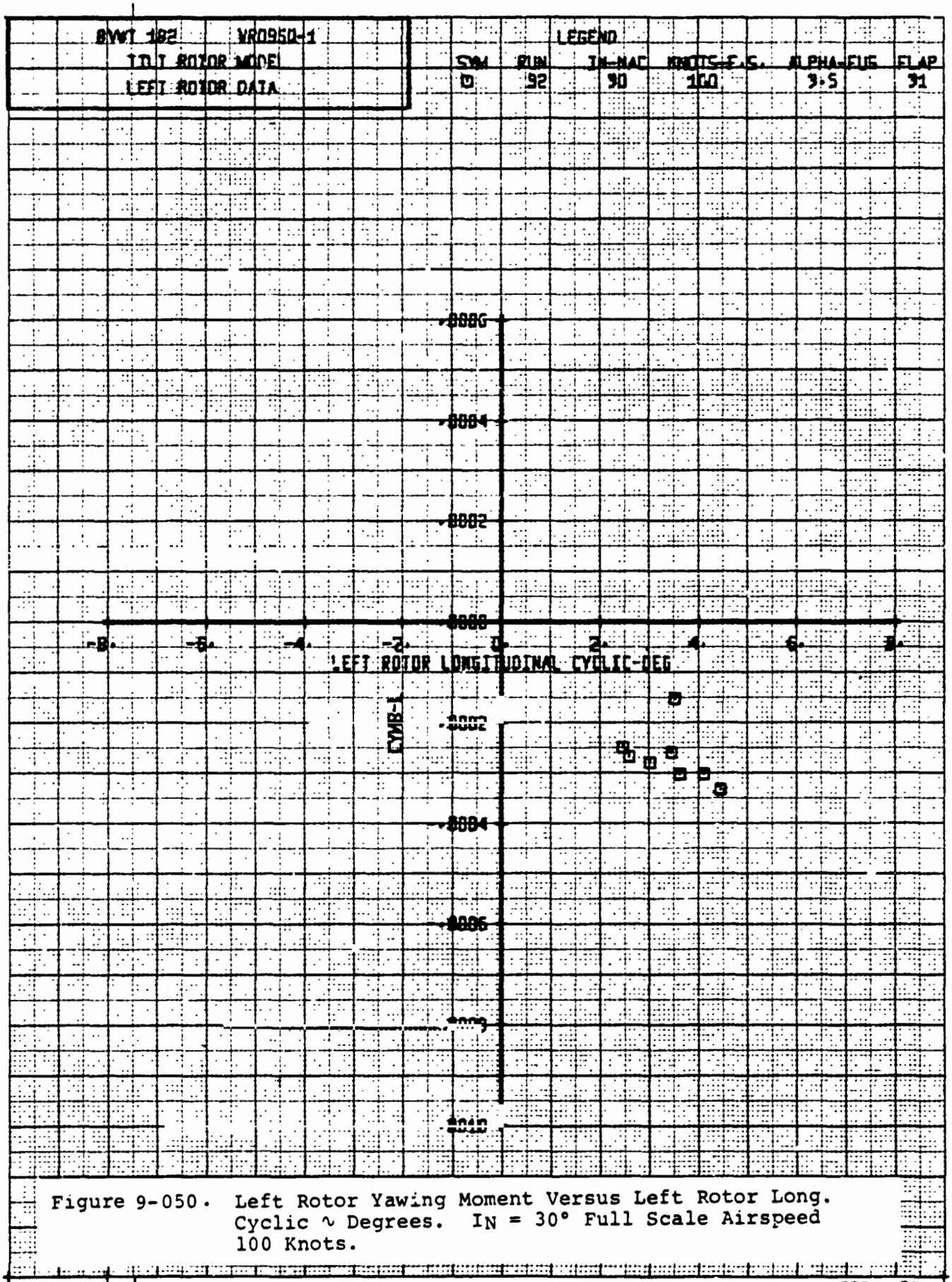

Figure 9-050. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. IN = 30° Full Scale Airspeed 100 Knots.

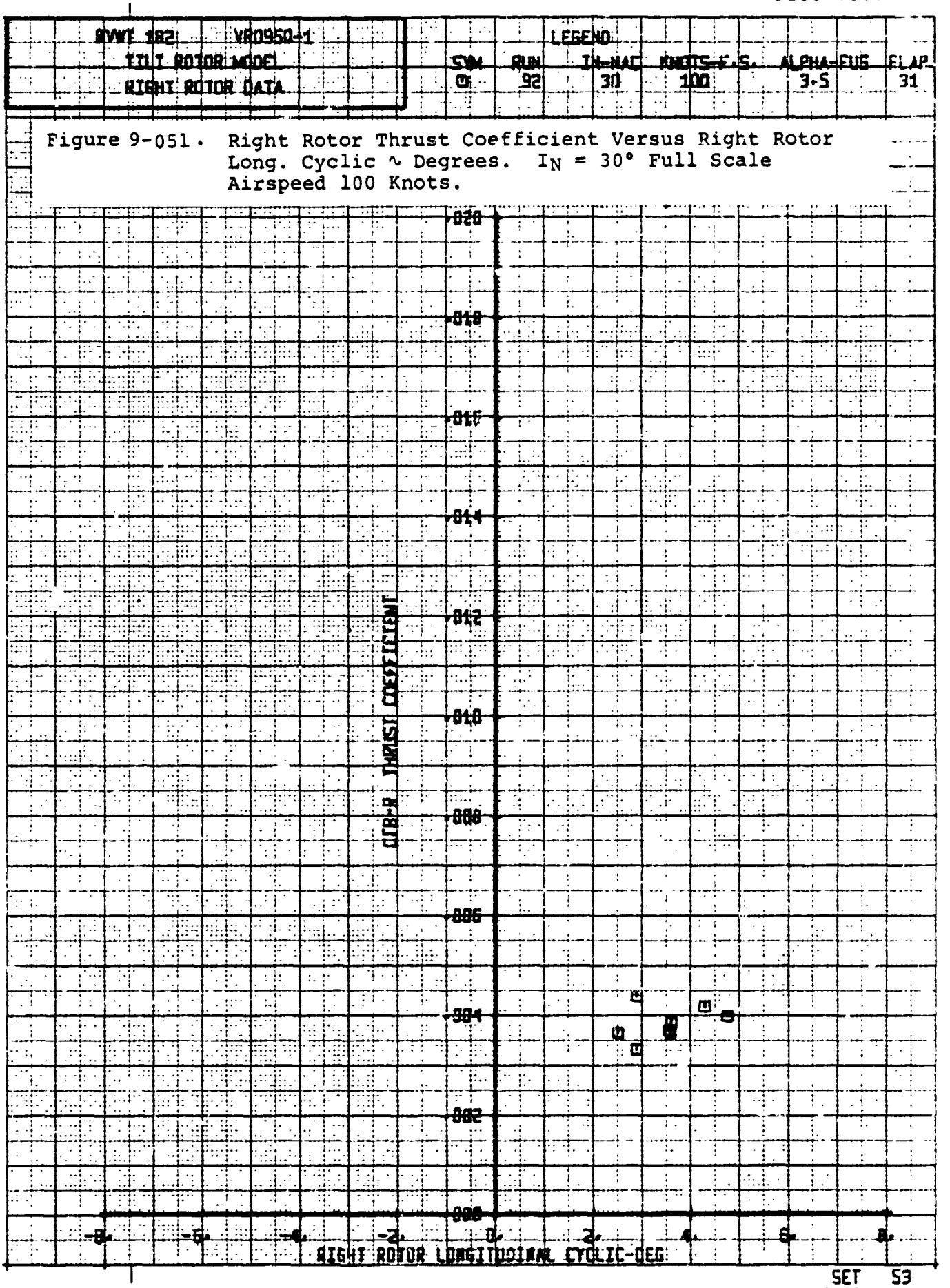

Figure 9-051. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

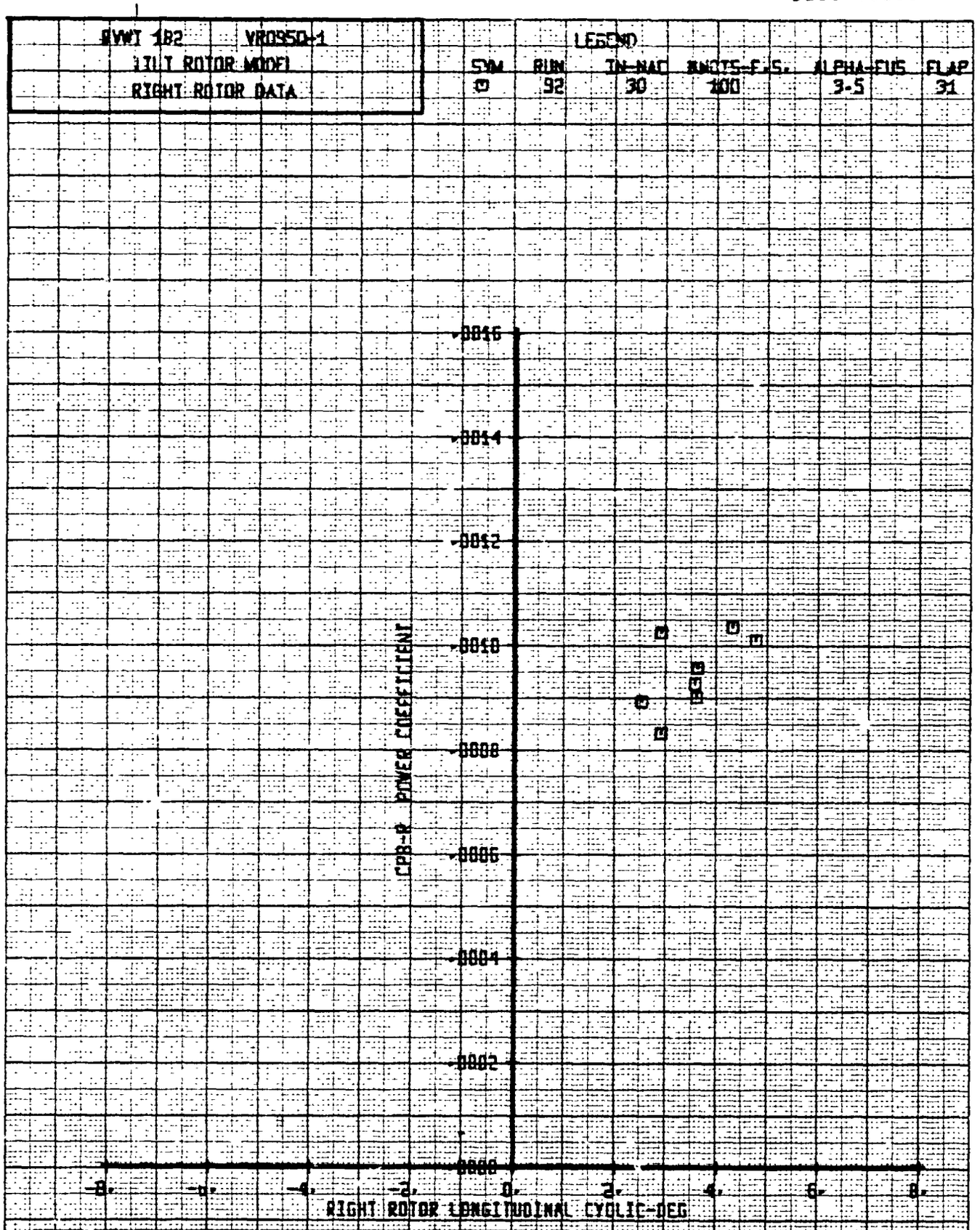

Figure 9-052. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

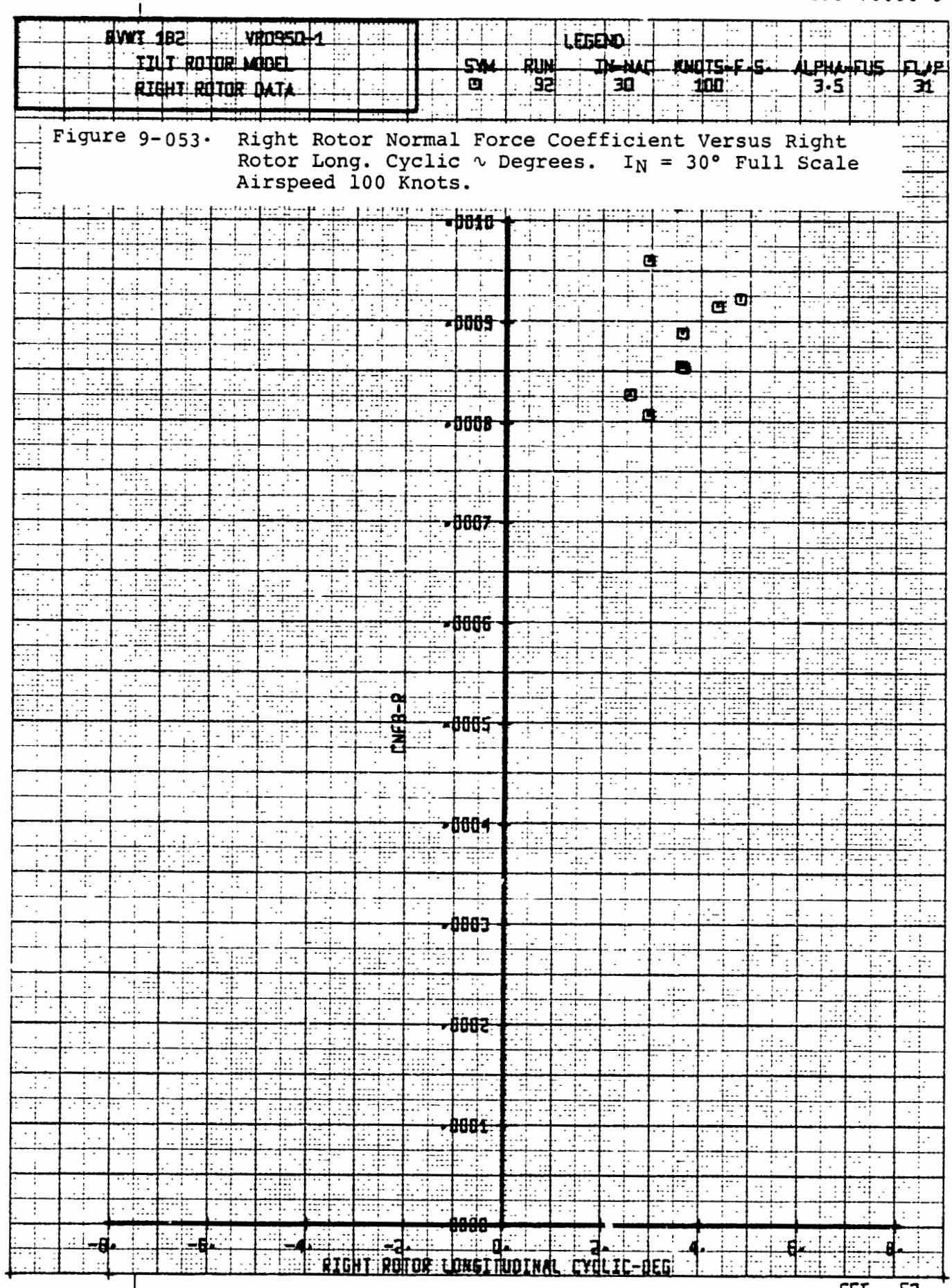

Figure 9-053. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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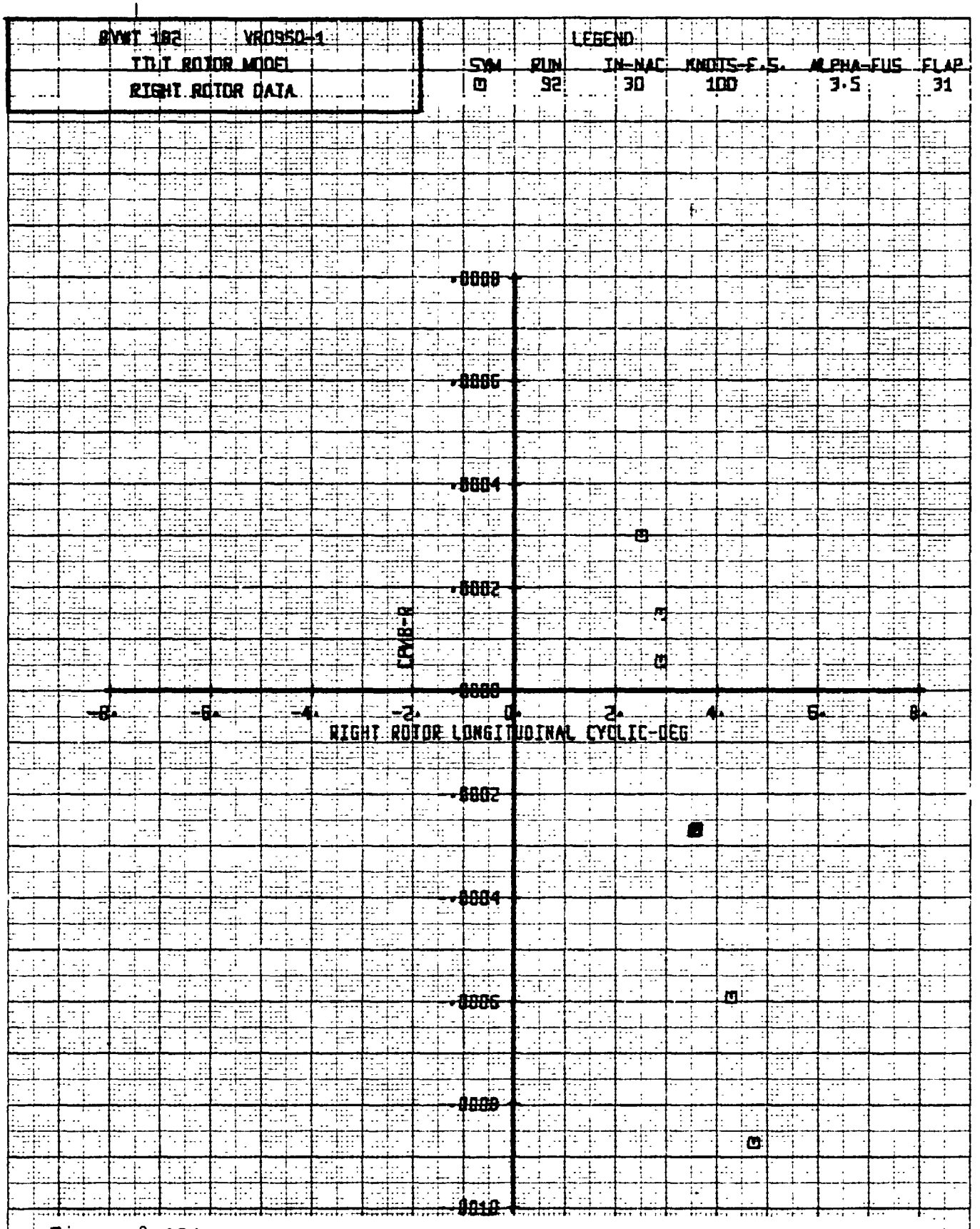

Figure 9-054. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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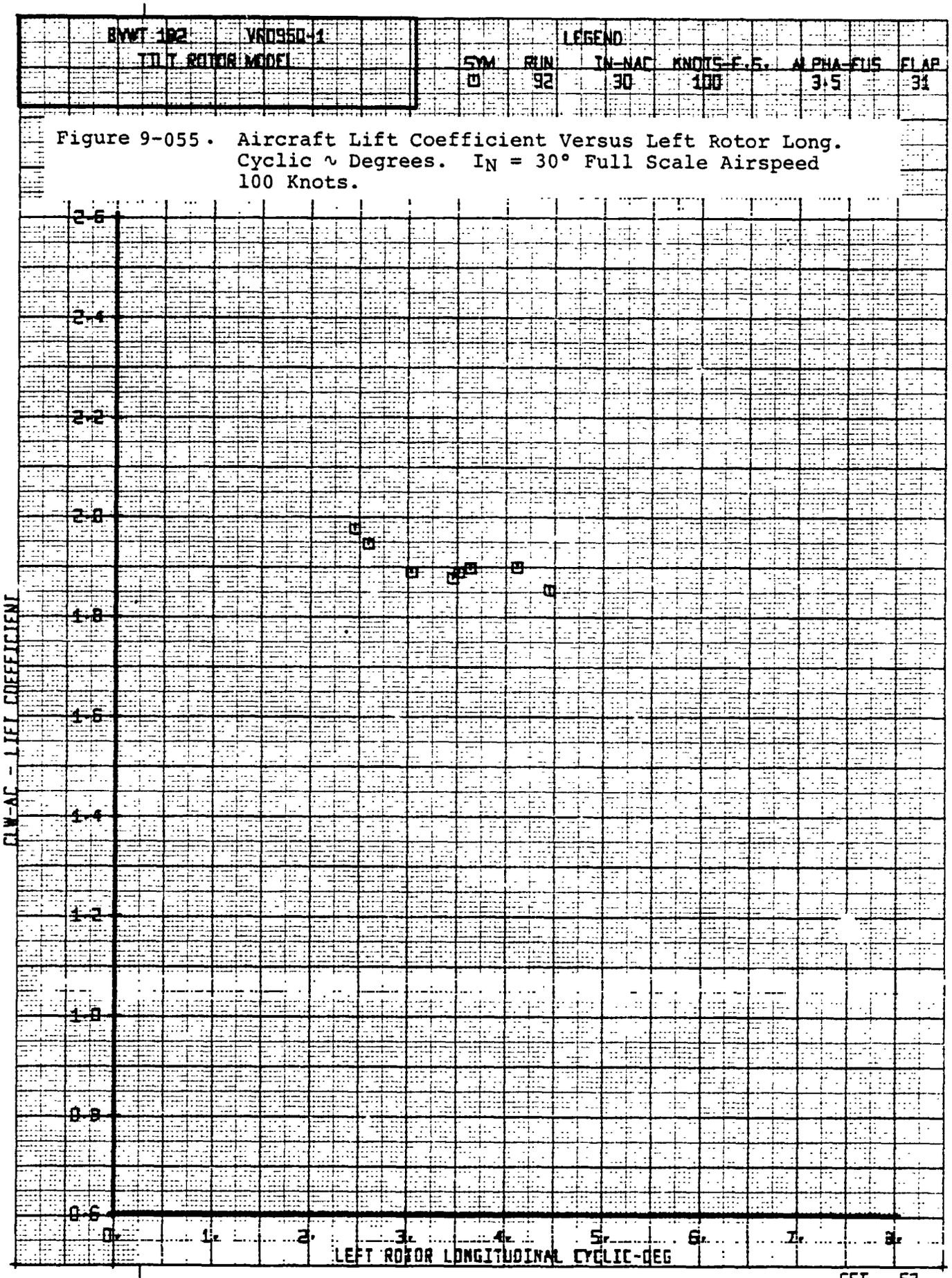

Figure 9-055. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

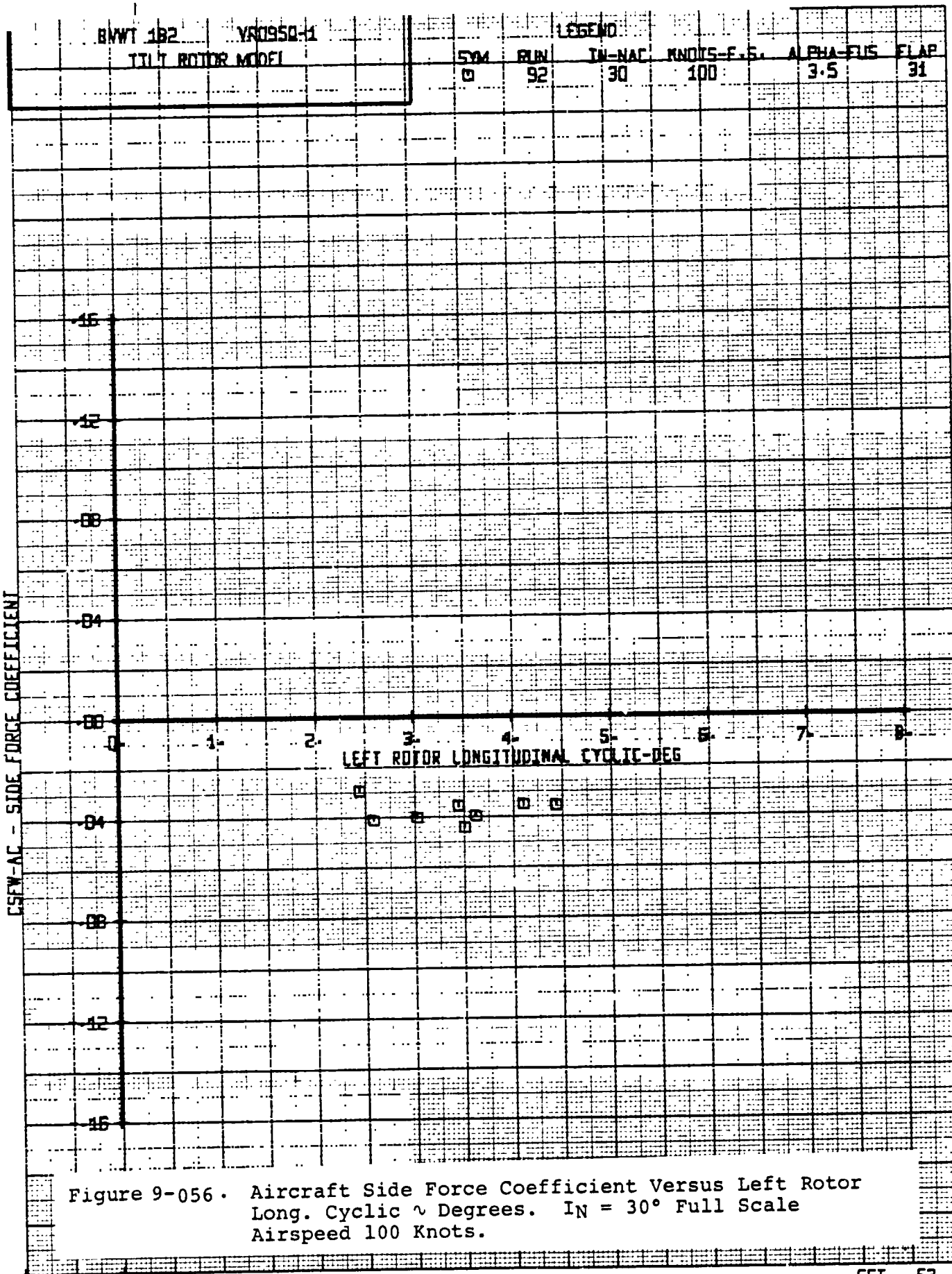

Figure 9-056. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

53
182

SET 53
BWT 182

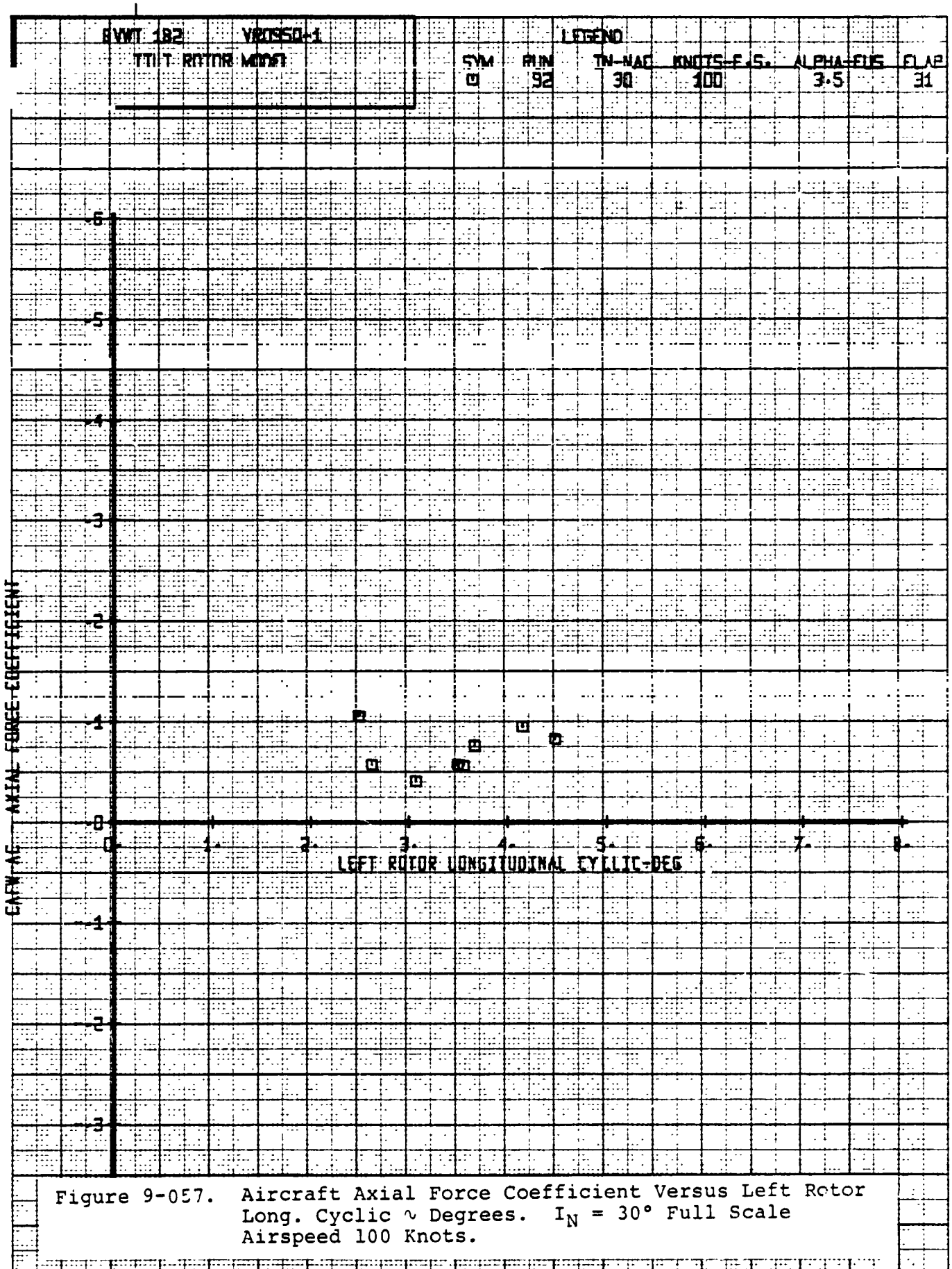

Figure 9-057. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

FT 53
1 182

SET 53
BVWT 182

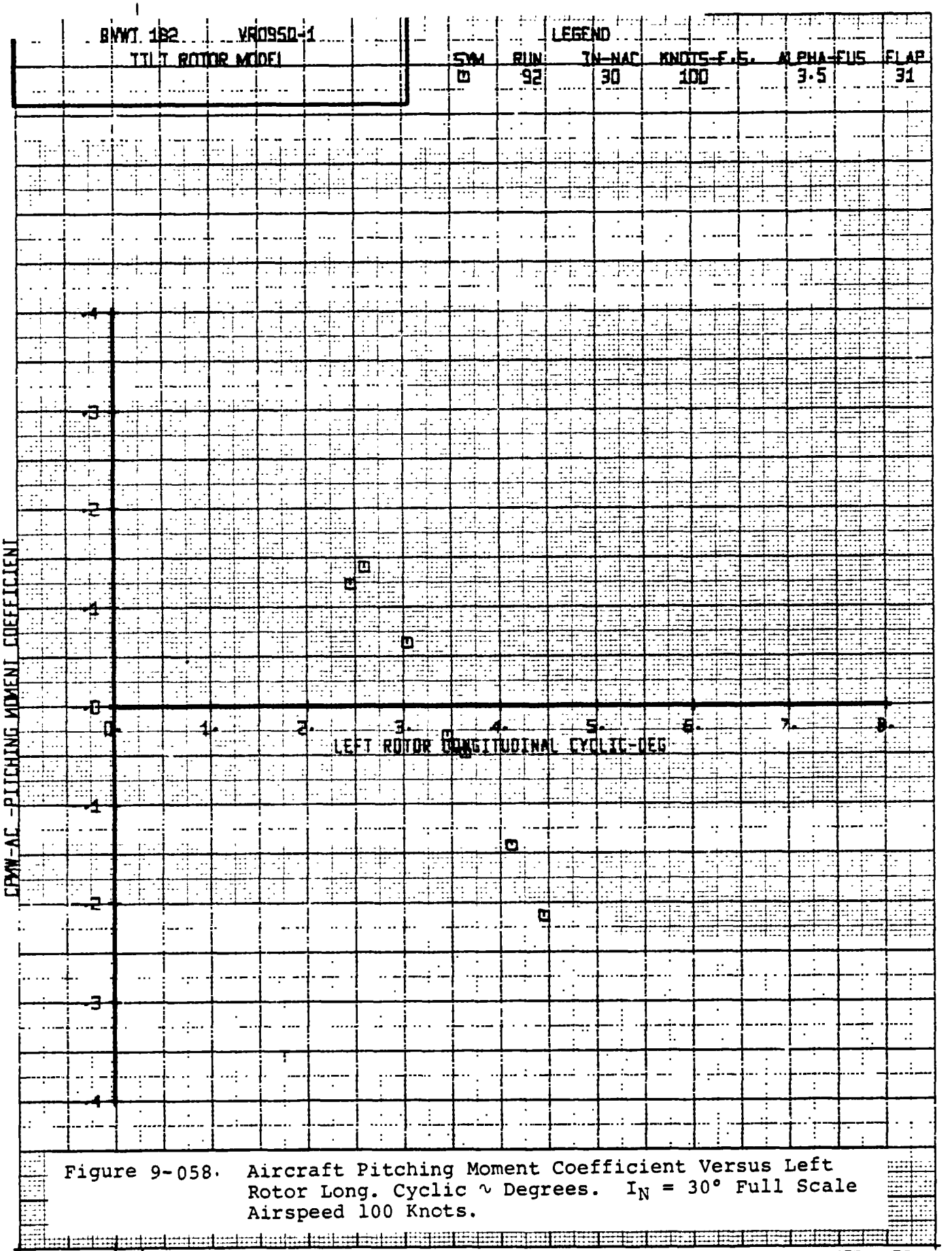

Figure 9-058. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

53
182

SET 53
BWT 182

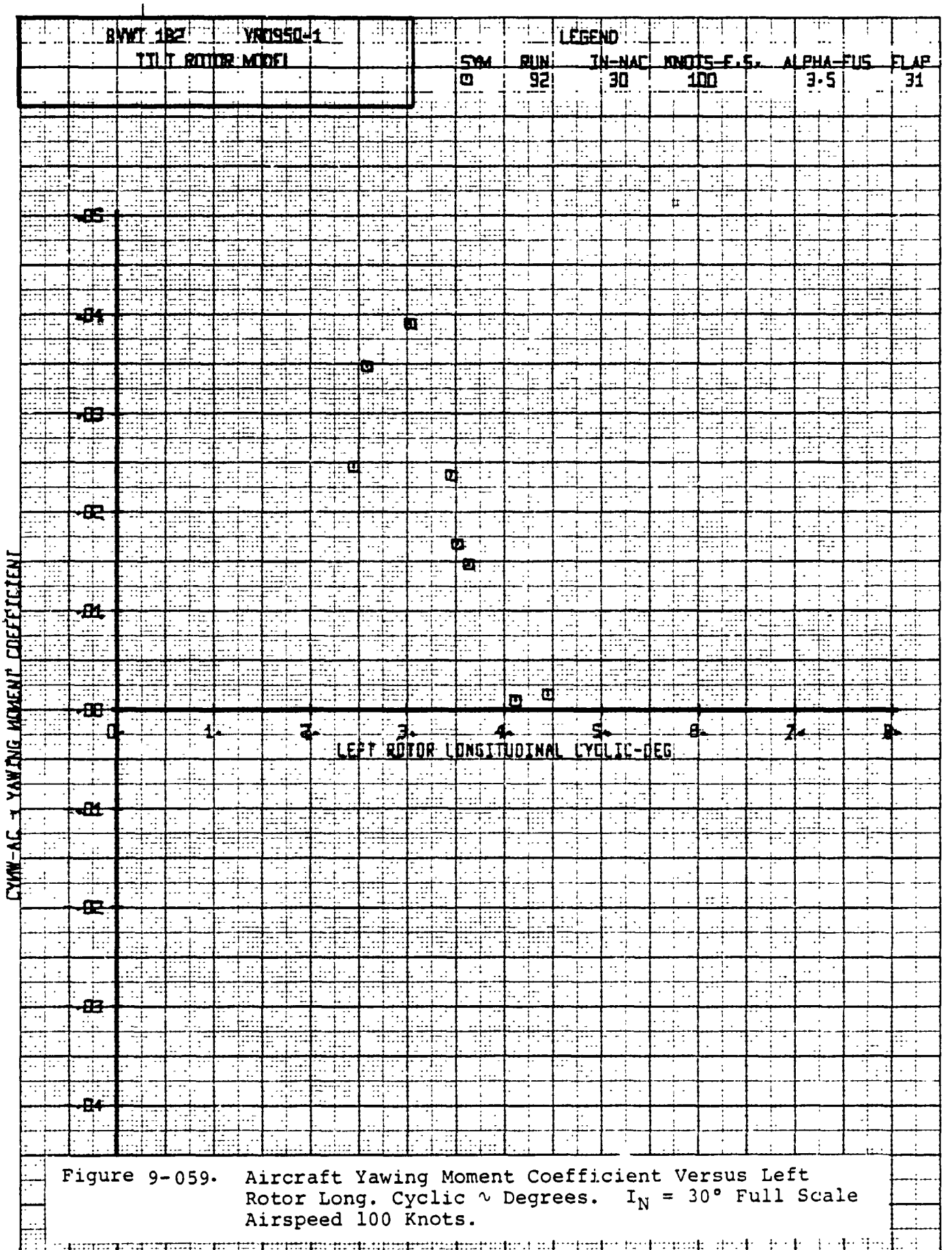

Figure 9-059. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

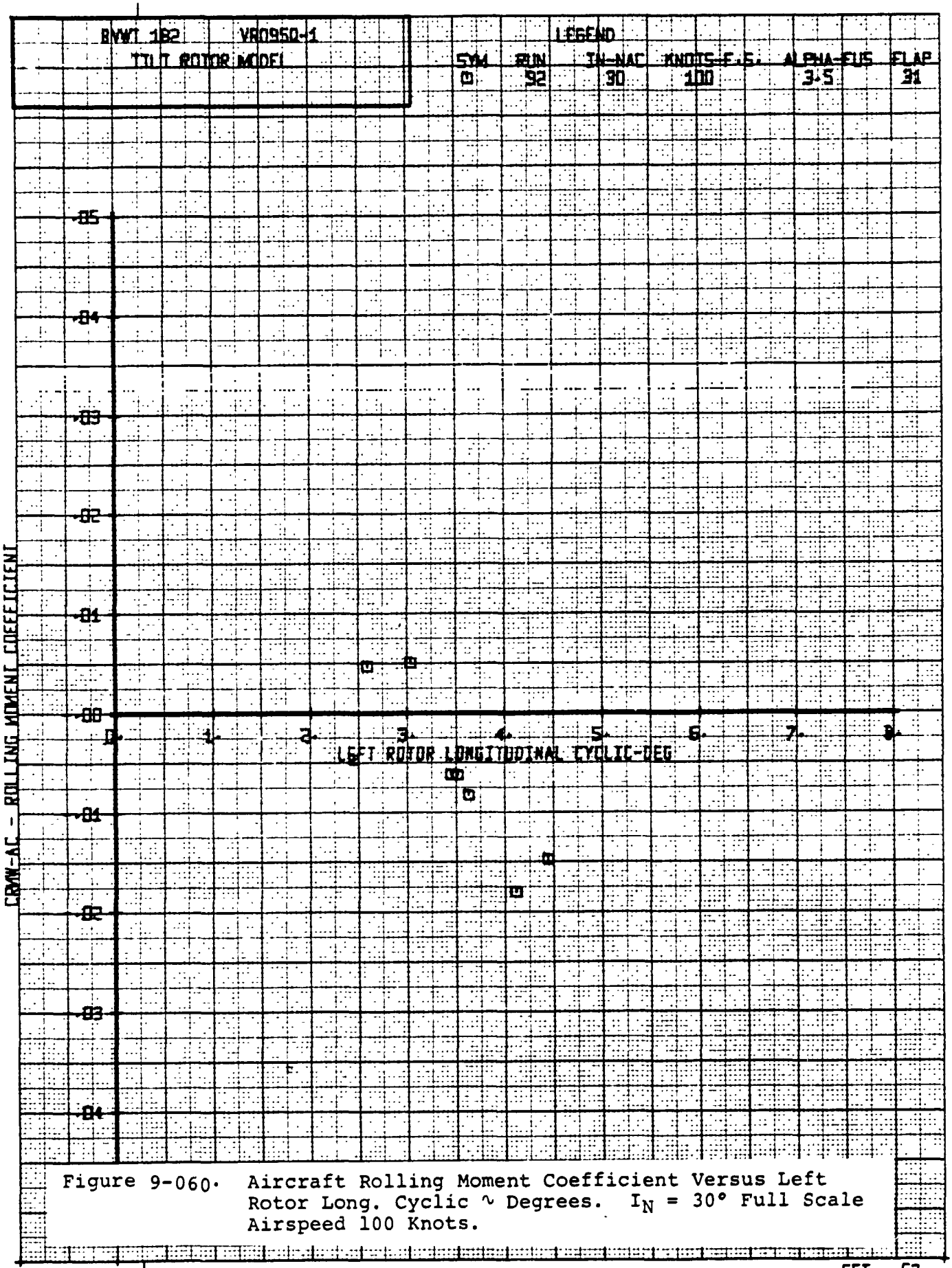

Figure 9-060. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

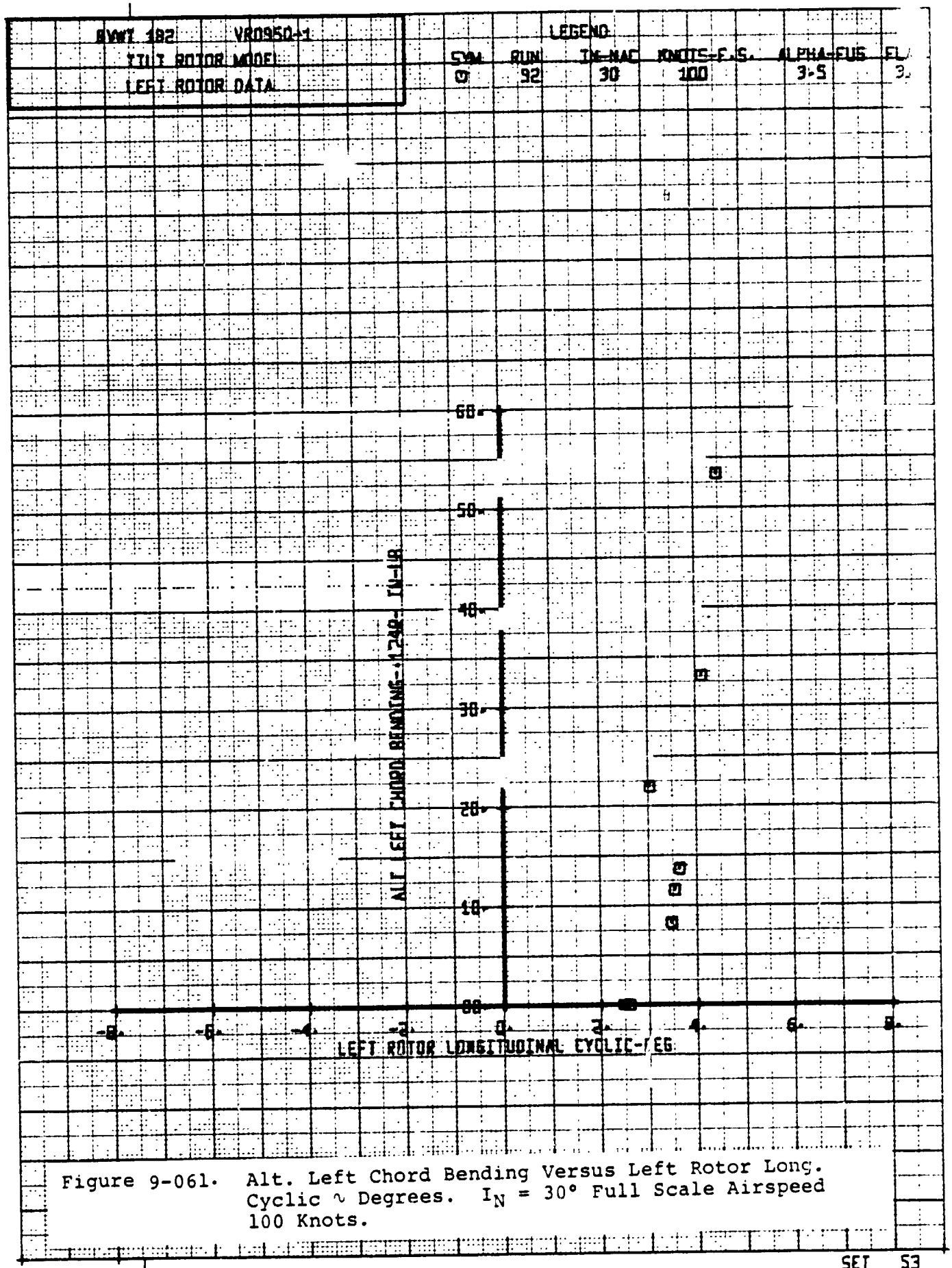

Figure 9-061. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

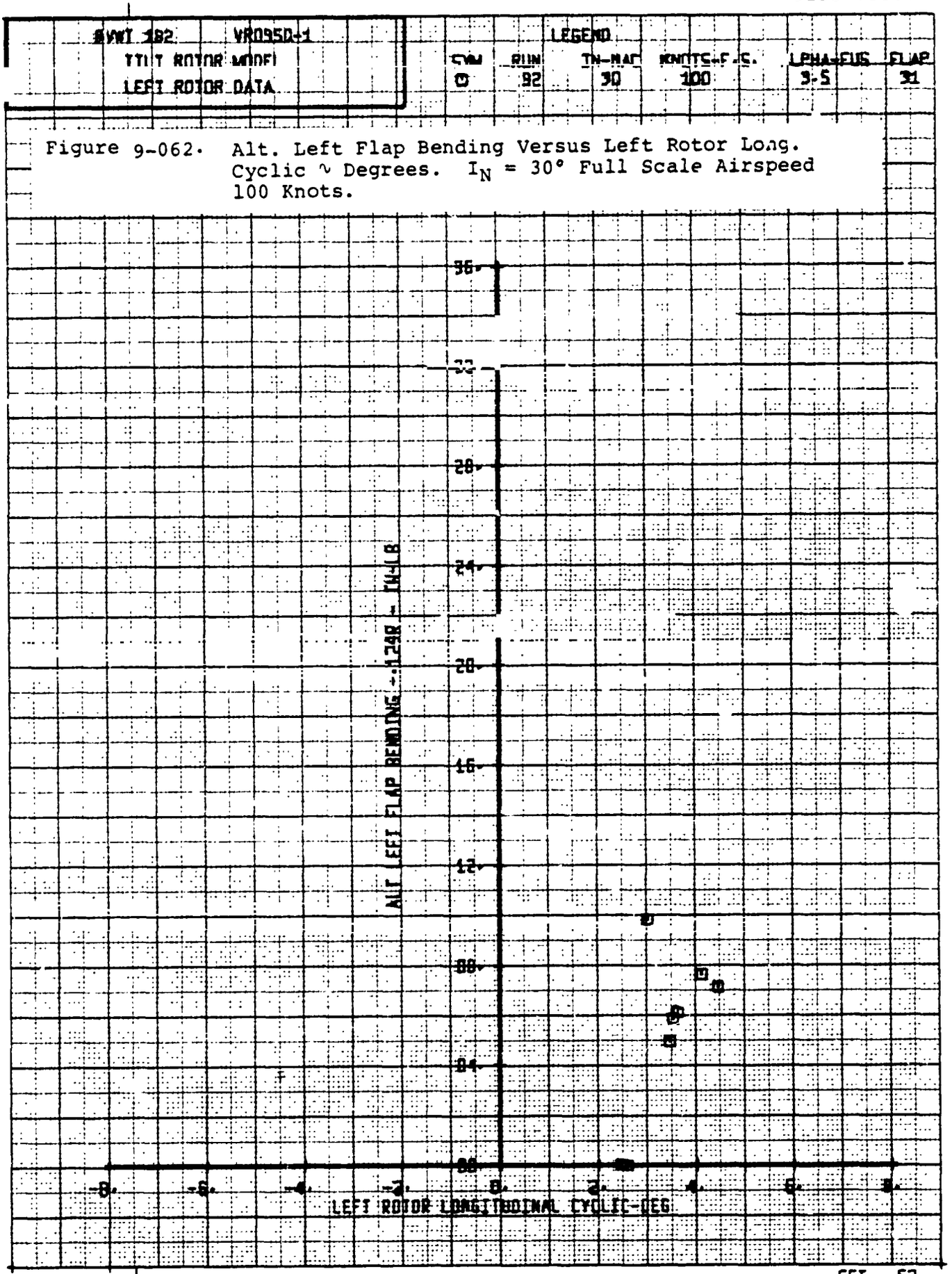

Figure 9-062. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

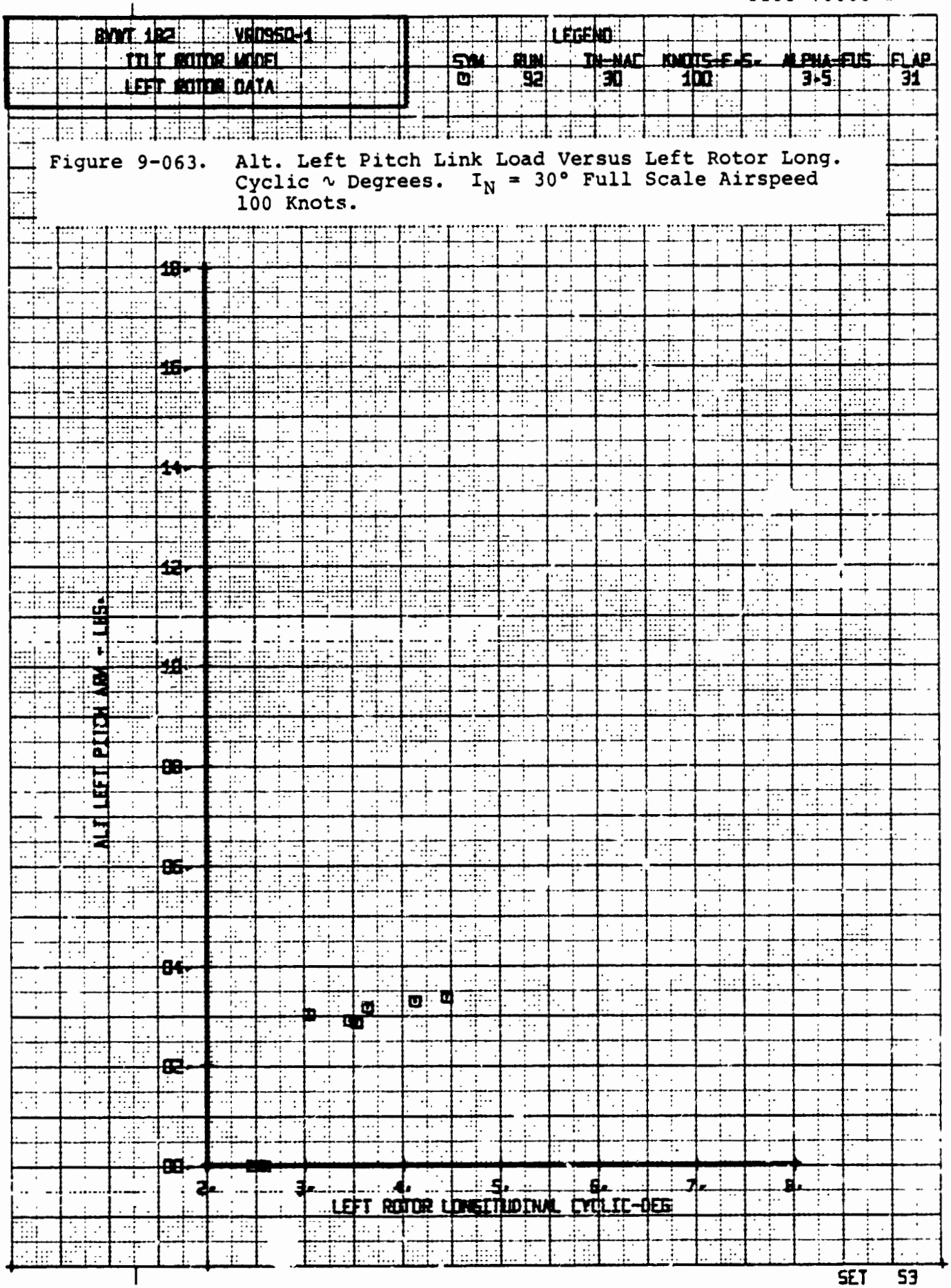

Figure 9-063. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

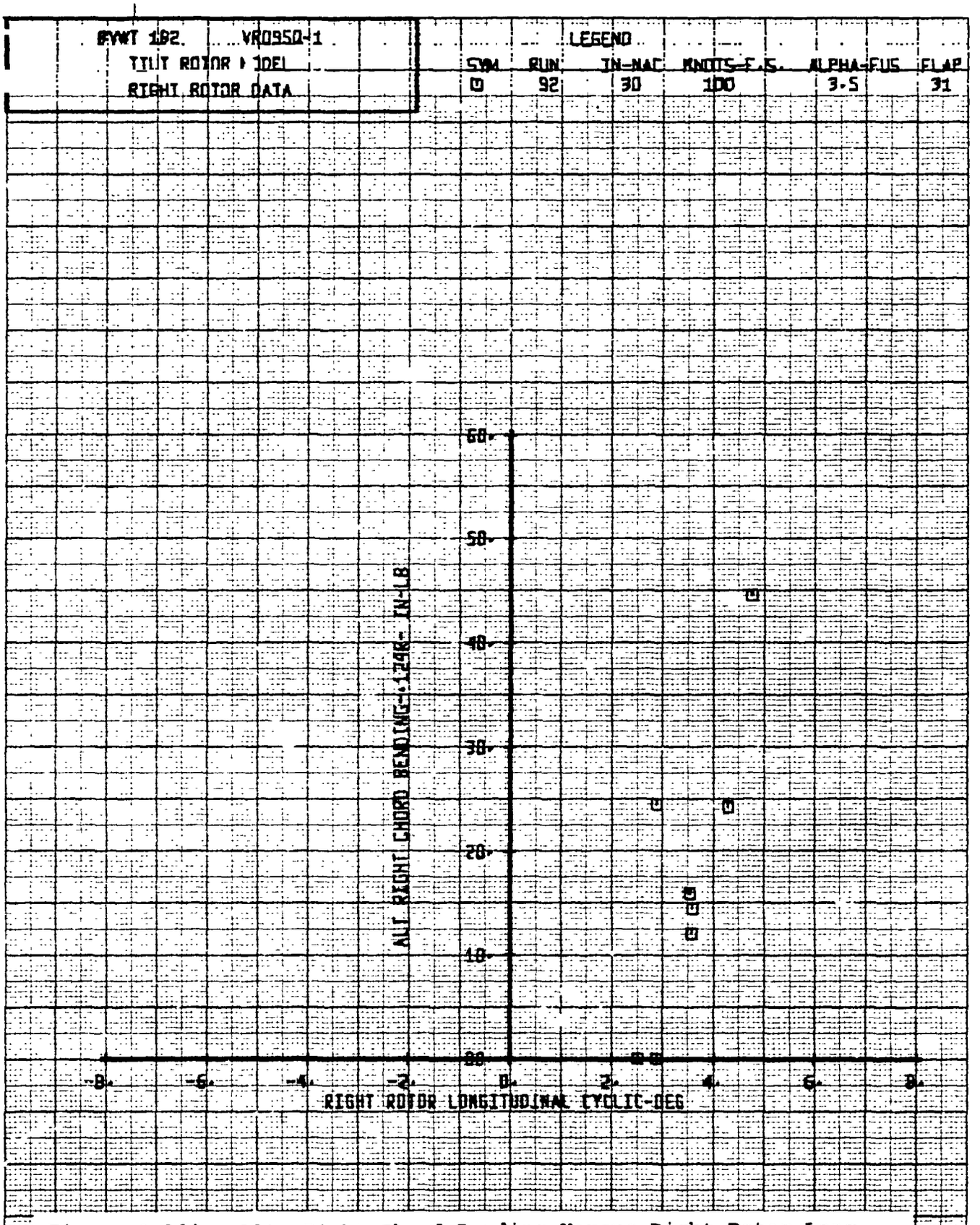

Figure 9-064. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

S3 182

SET S3 BVWT 182

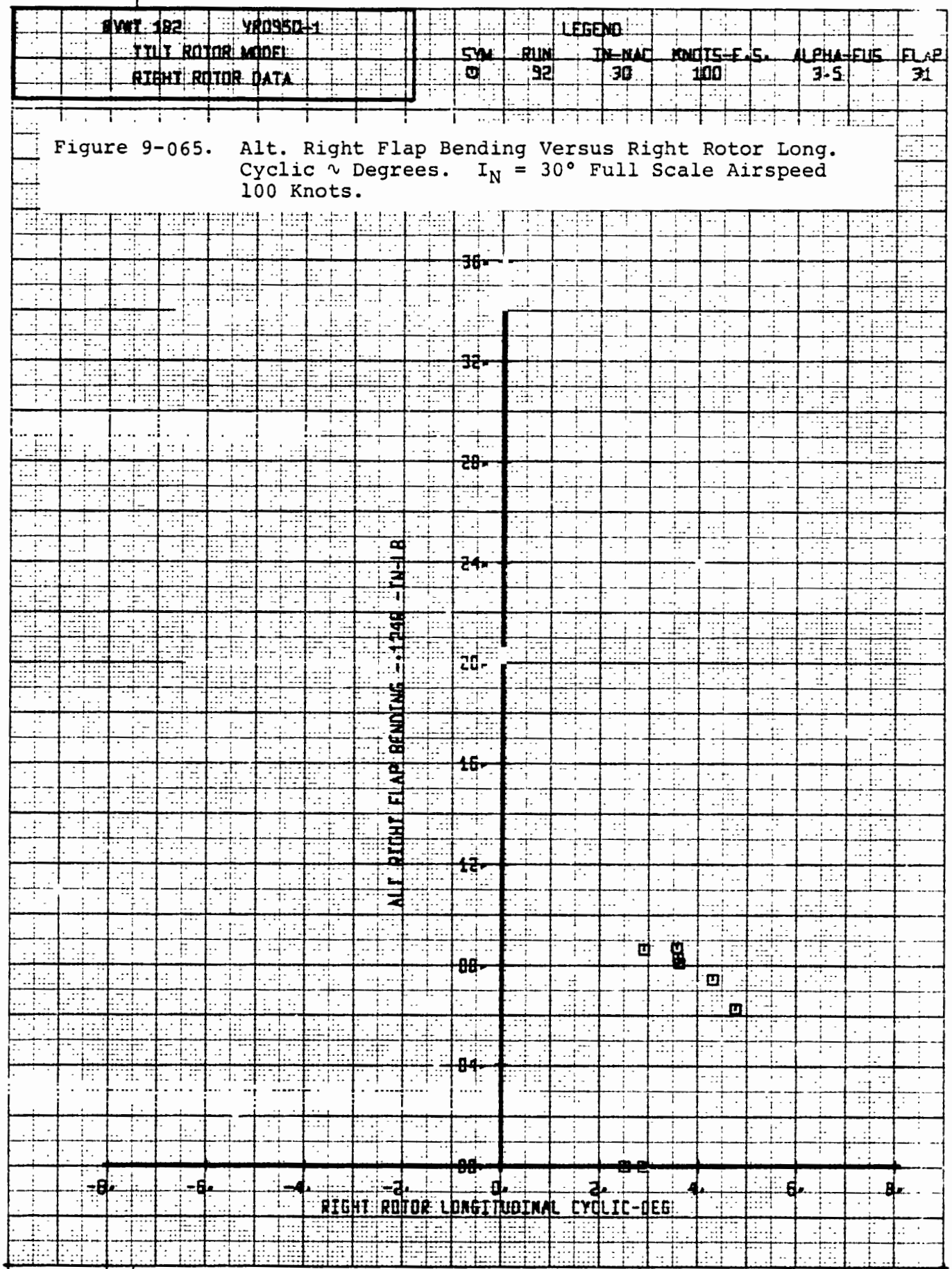

Figure 9-065. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

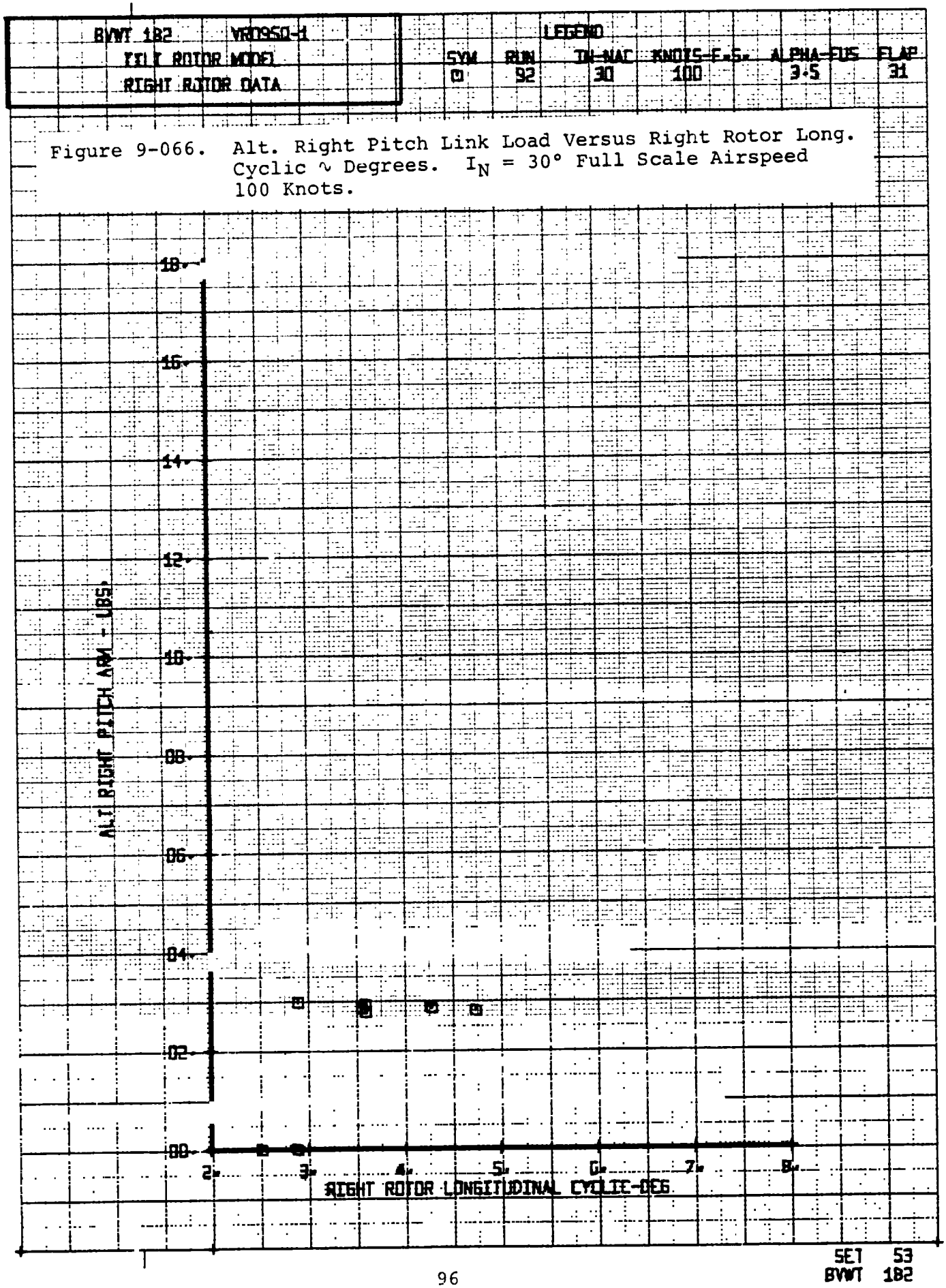

Figure 9-066. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

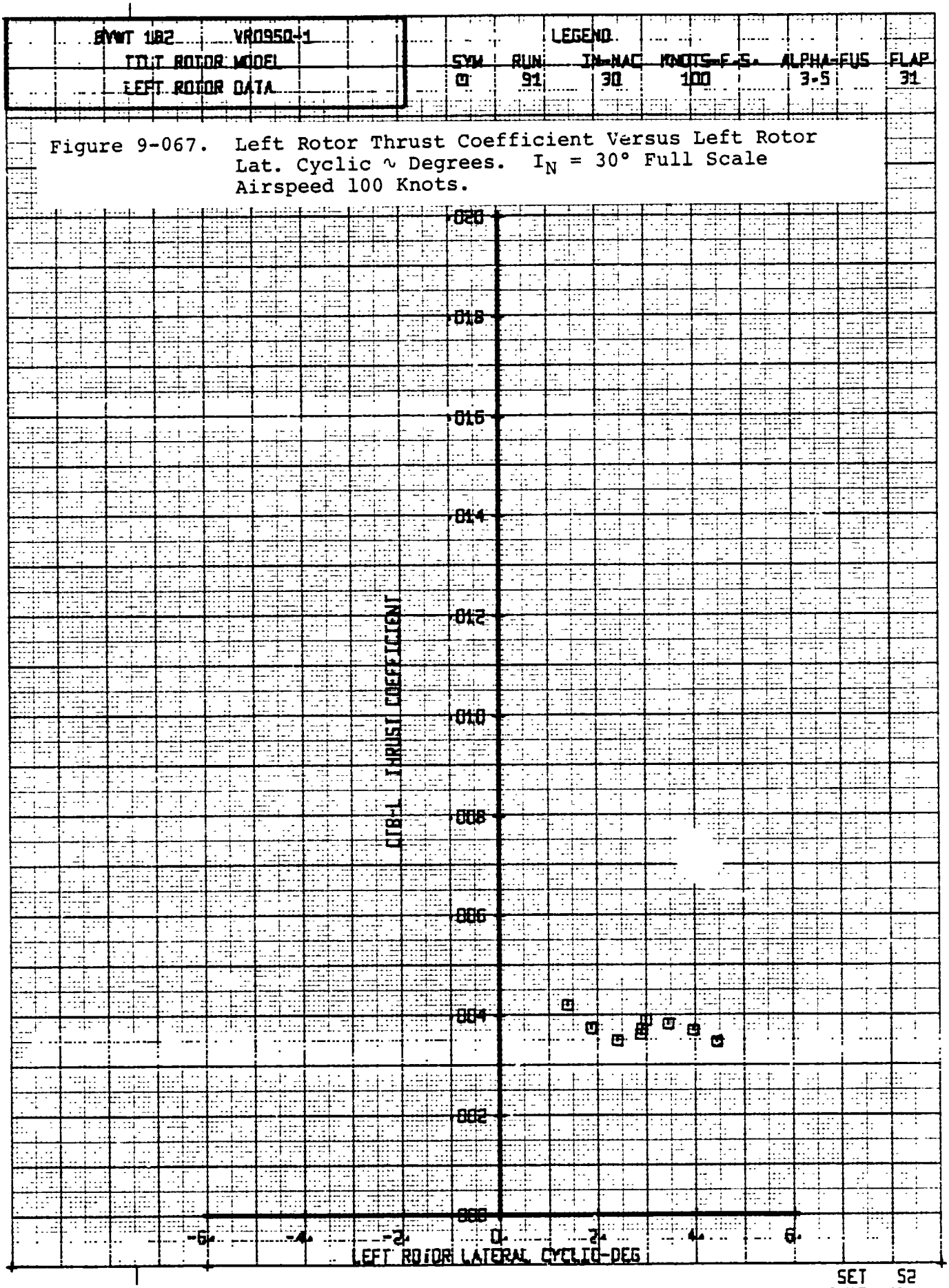

Figure 9-067. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

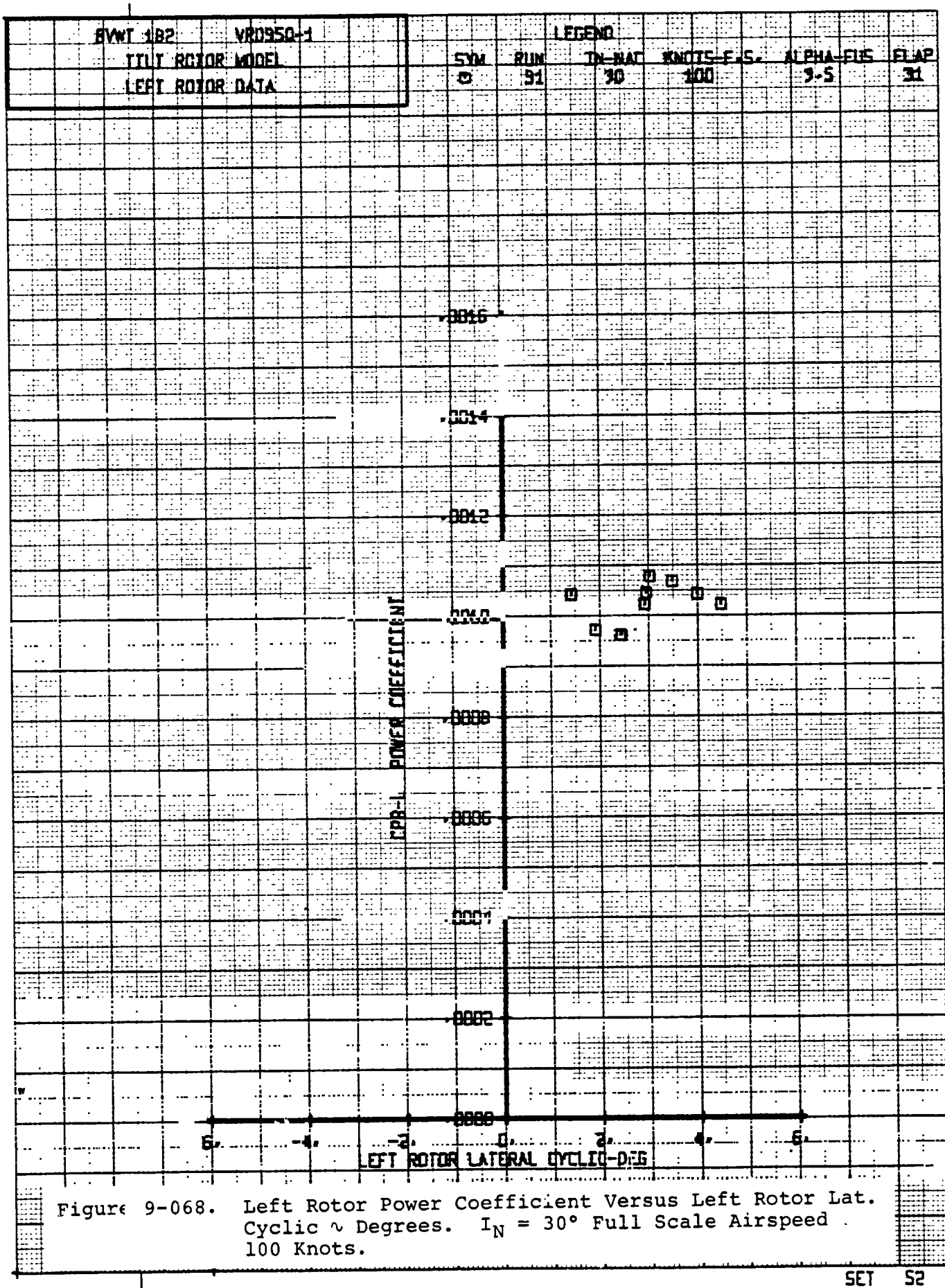

Figure 9-068. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

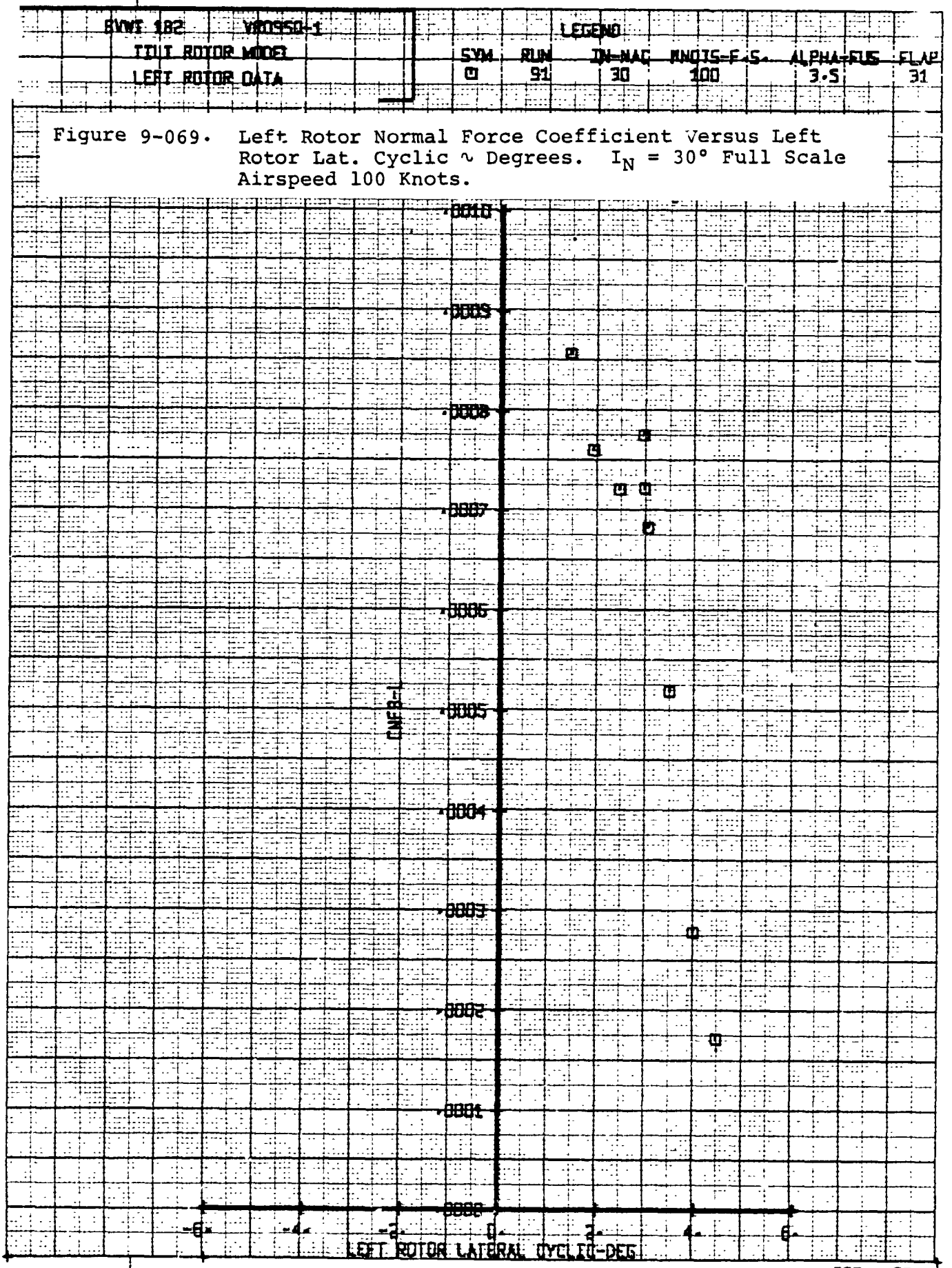

Figure 9-069. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

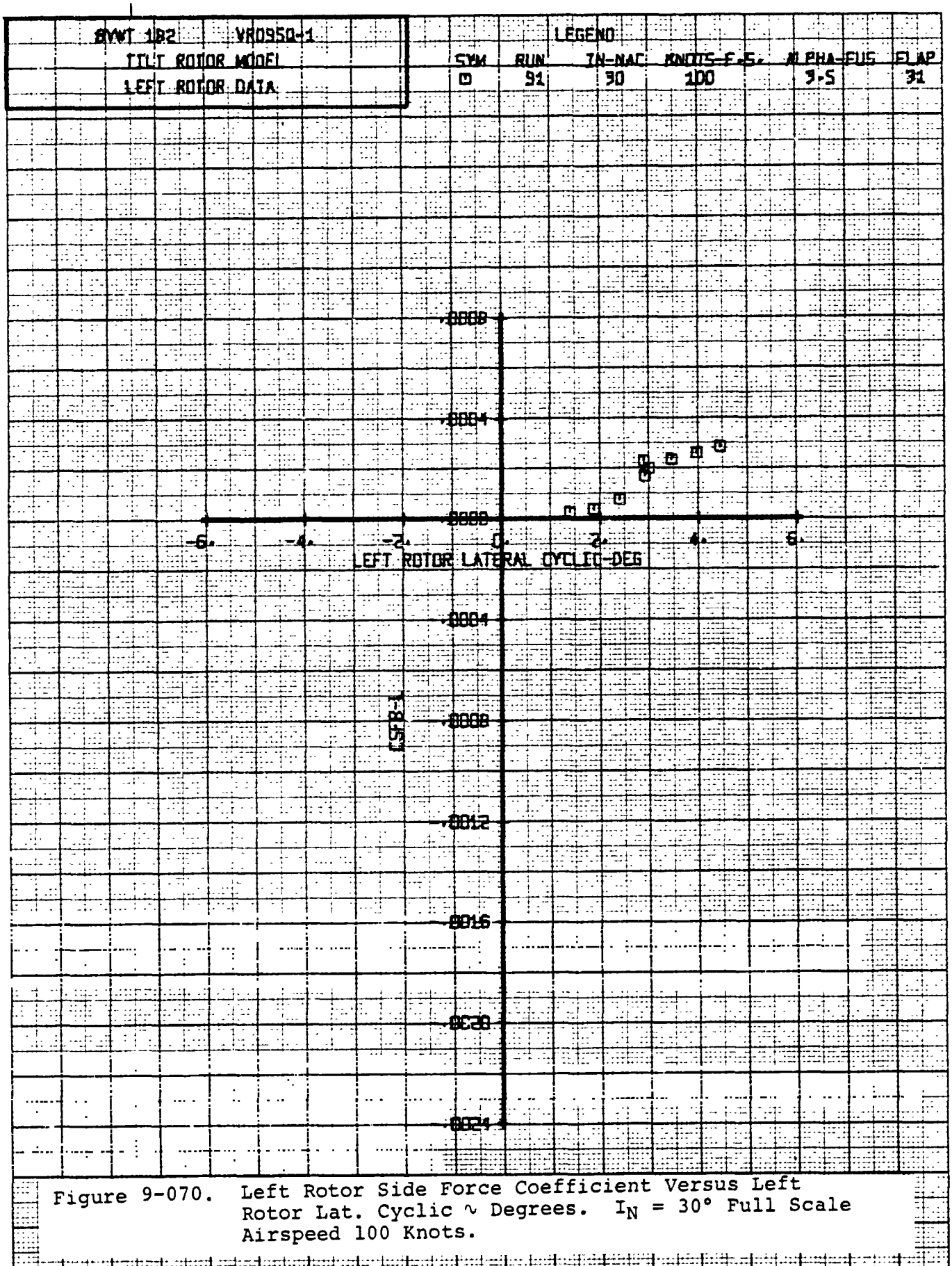

Figure 9-070. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

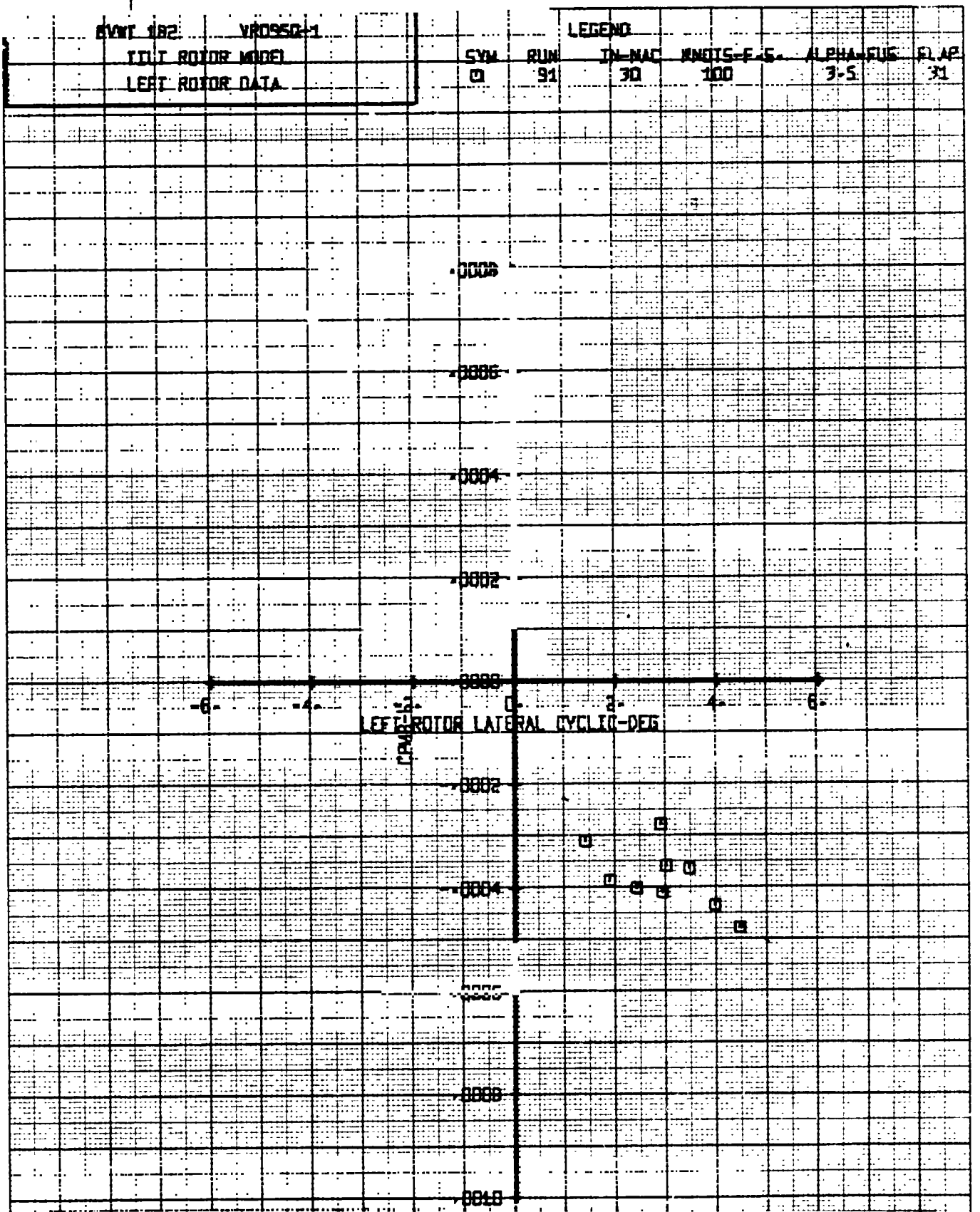

Figure 9-071. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

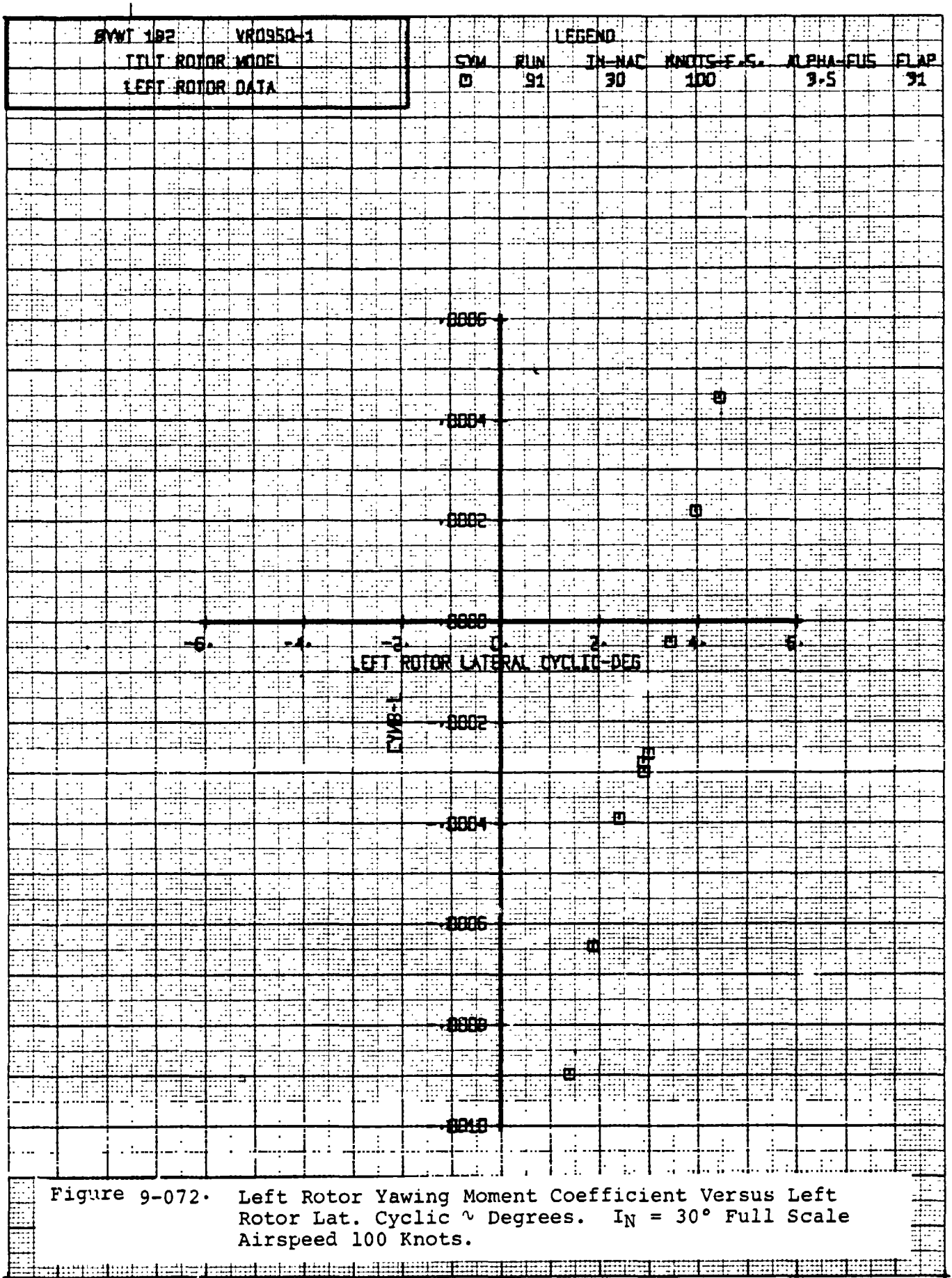

Figure 9-072. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

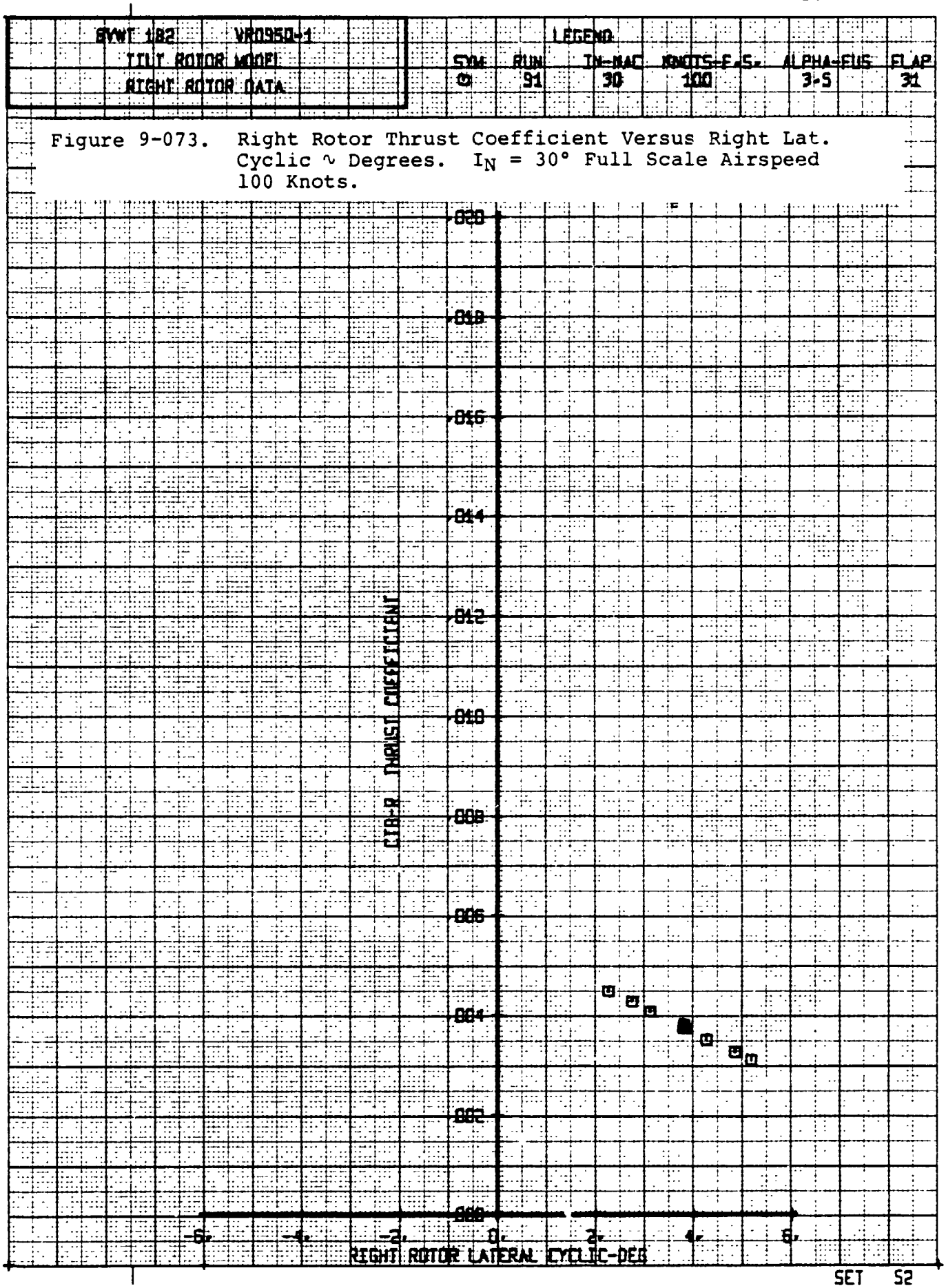

Figure 9-073. Right Rotor Thrust Coefficient Versus Right Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

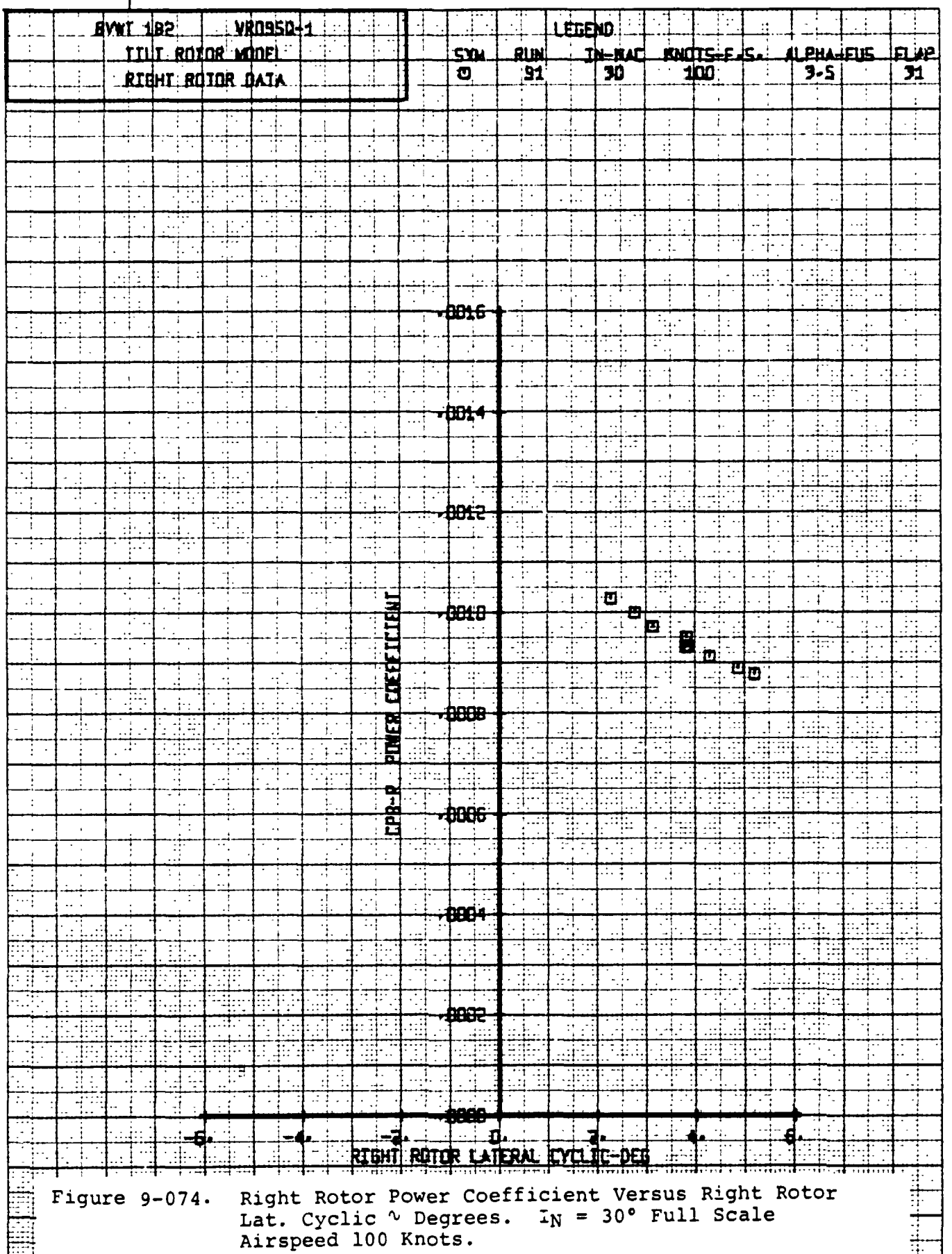

Figure 9-074. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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BVWT 182

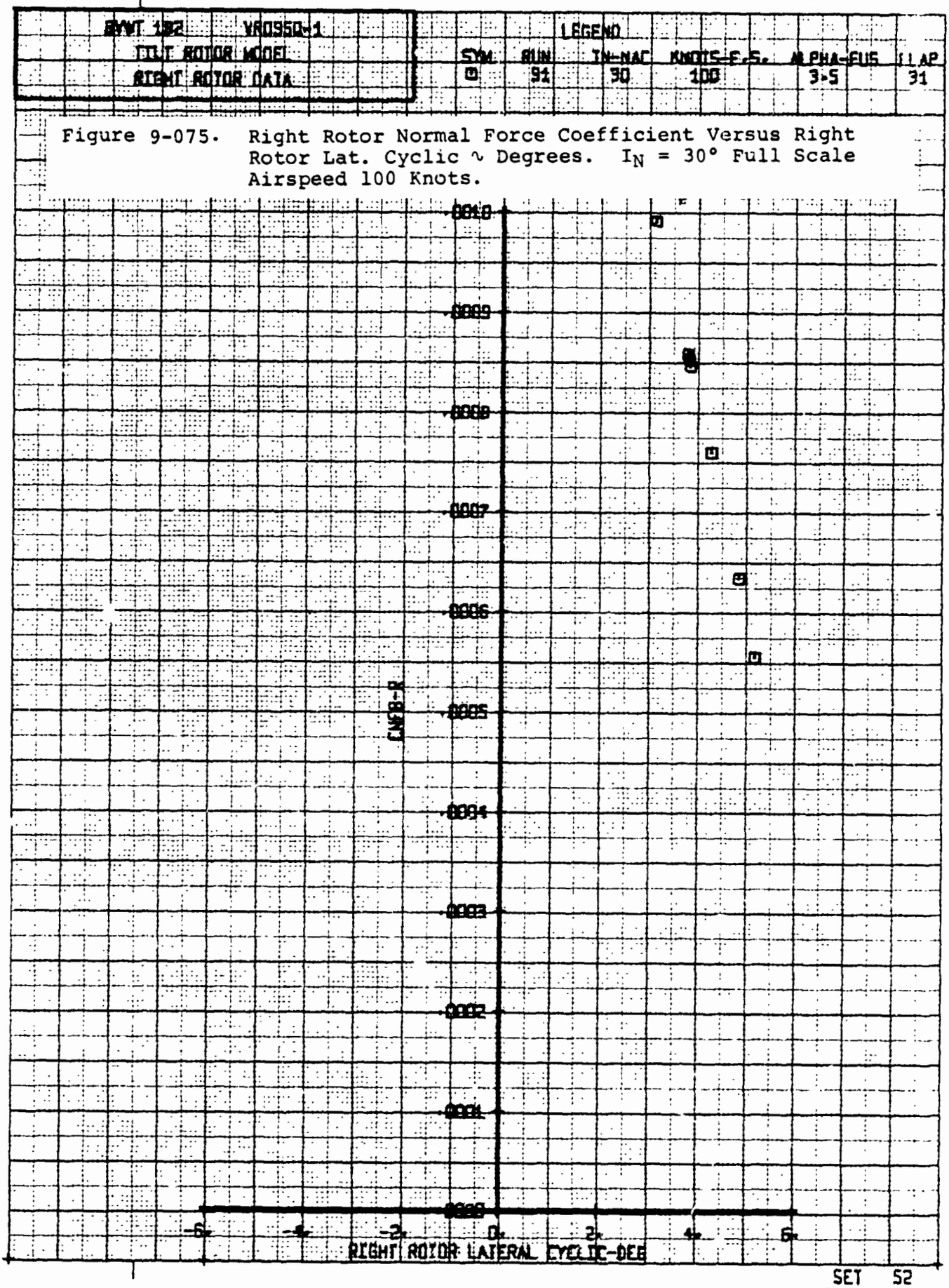

Figure 9-075. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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Refer to Section 3.0

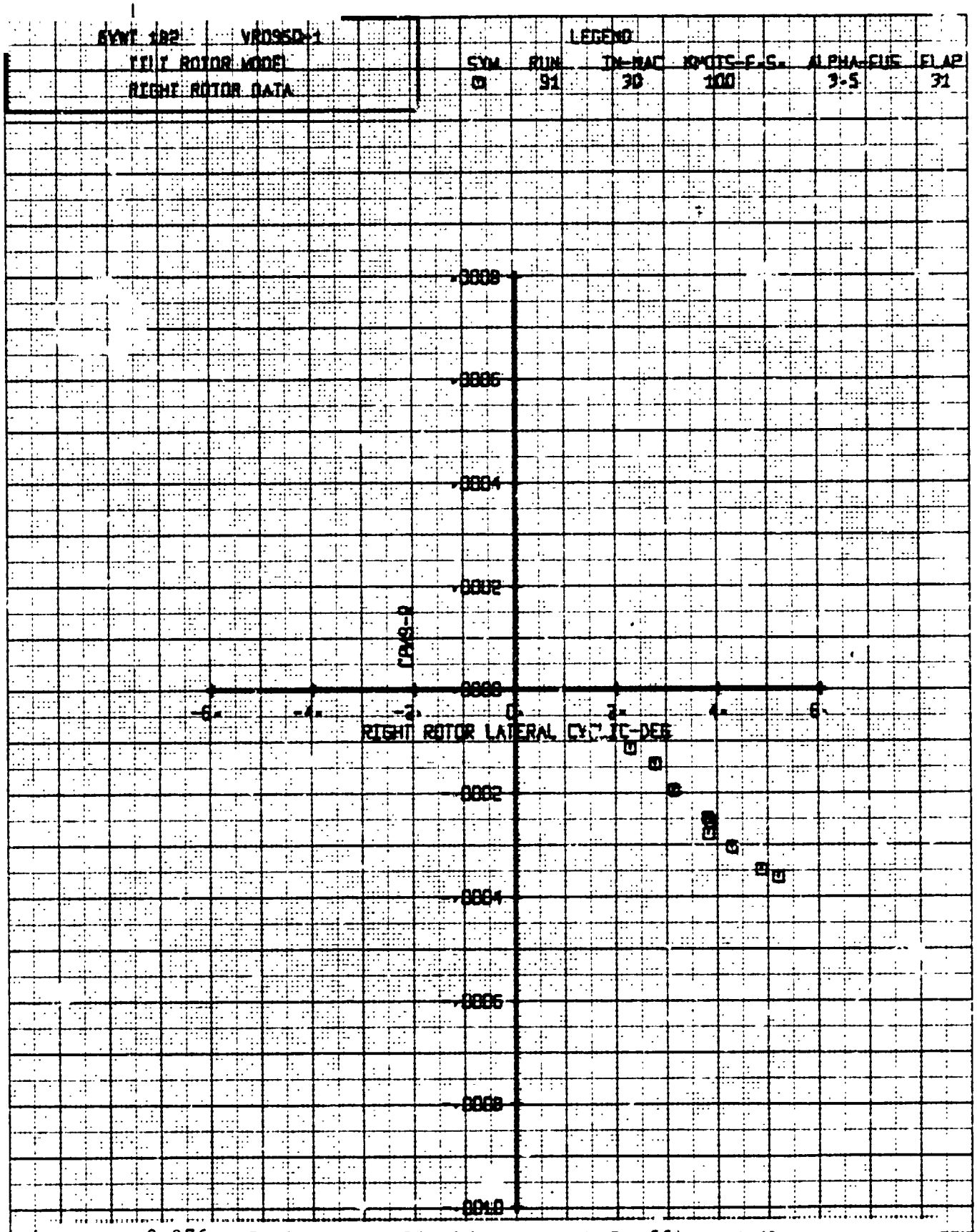

Figure 9-076. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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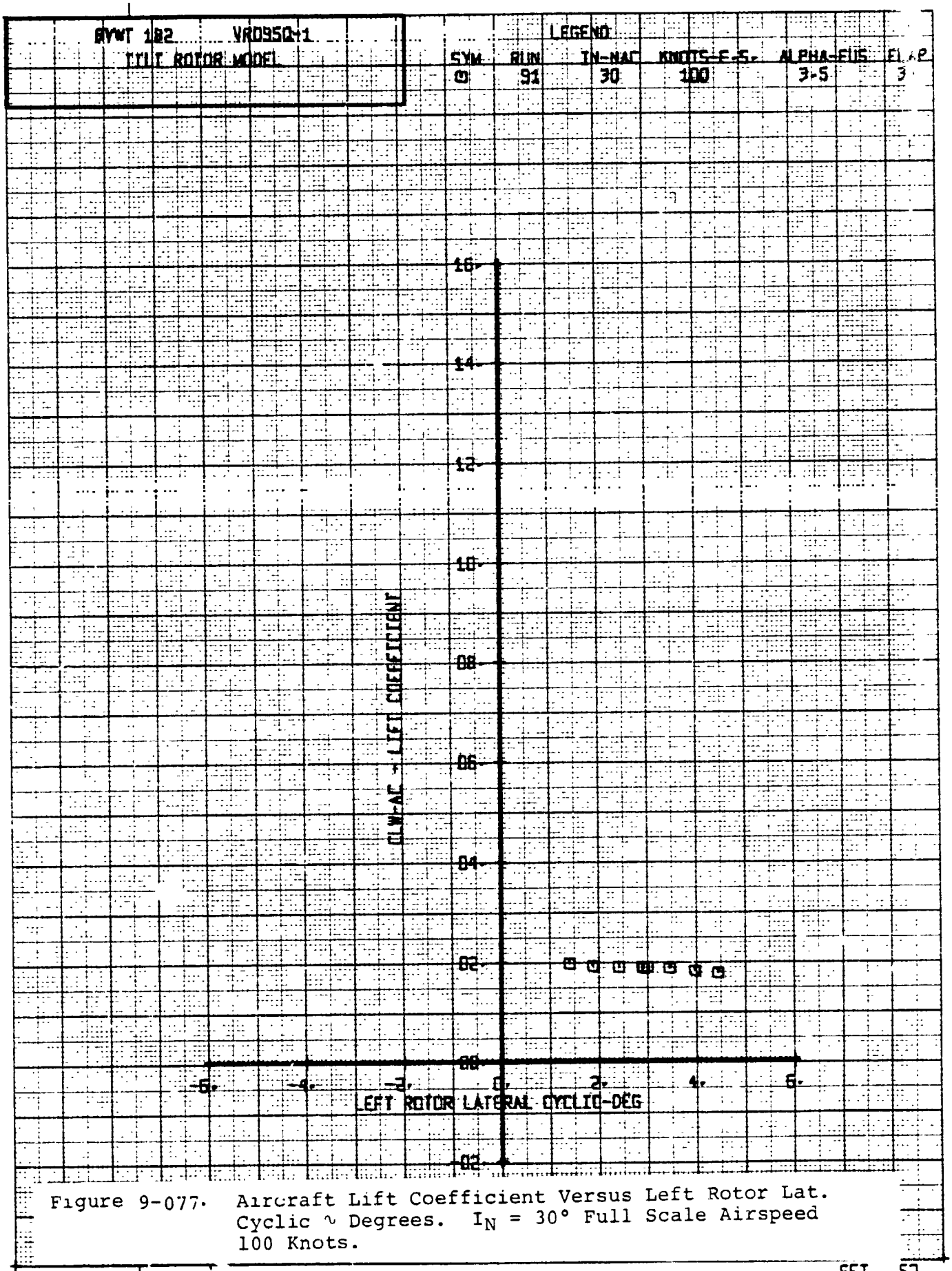

Figure 9-077. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

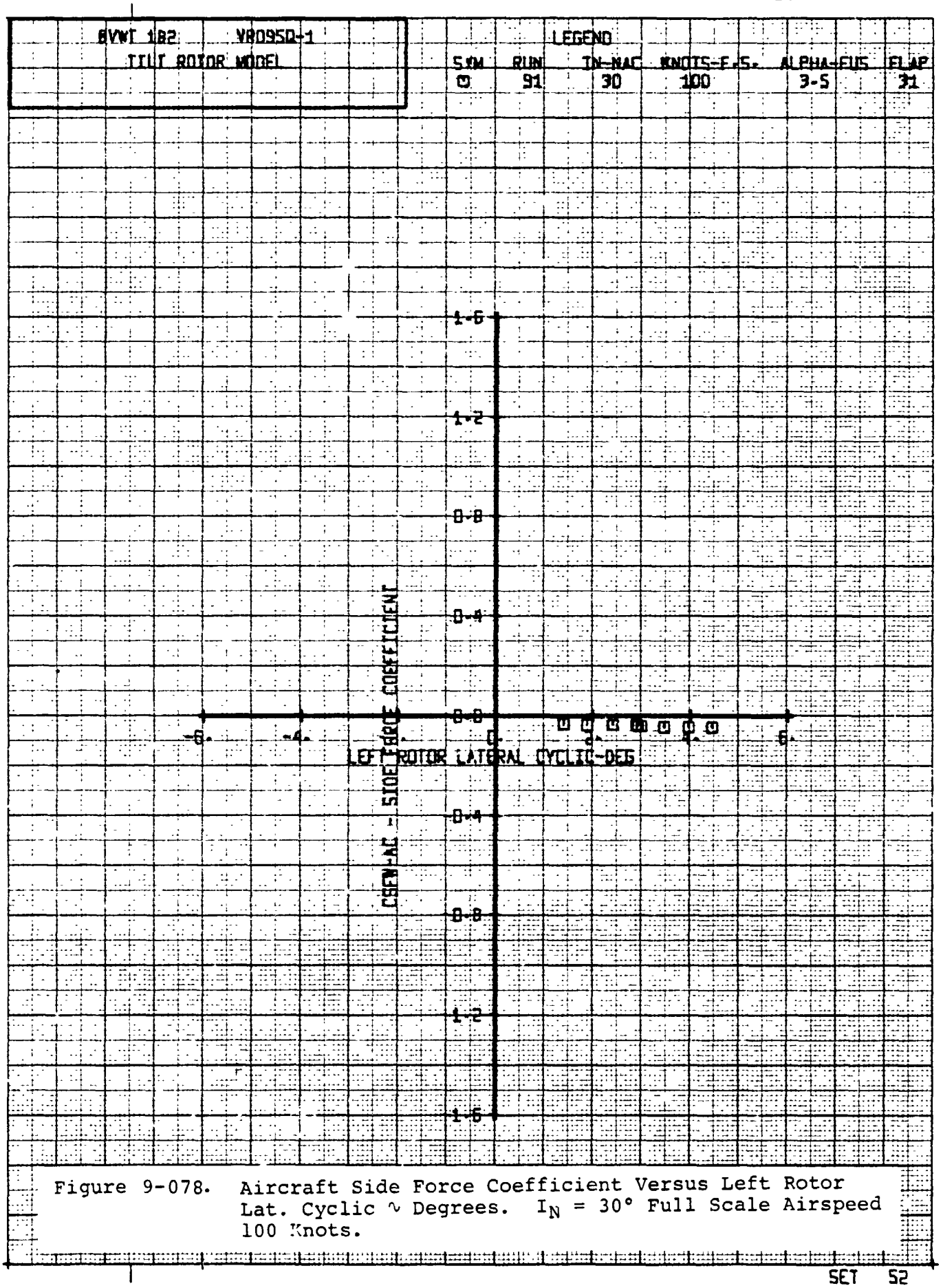

Figure 9-078. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

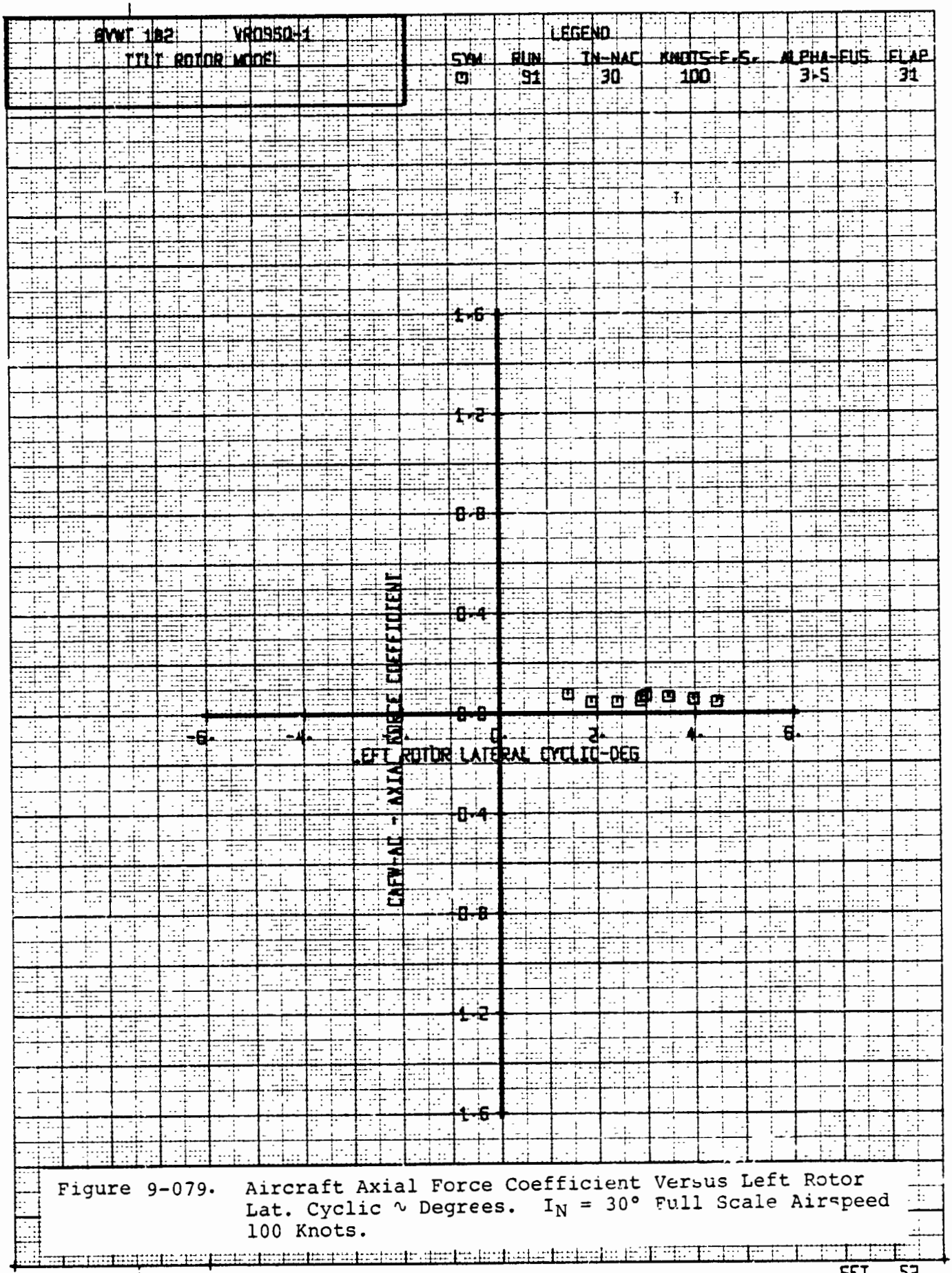

Figure 9-079. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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BVWT 182

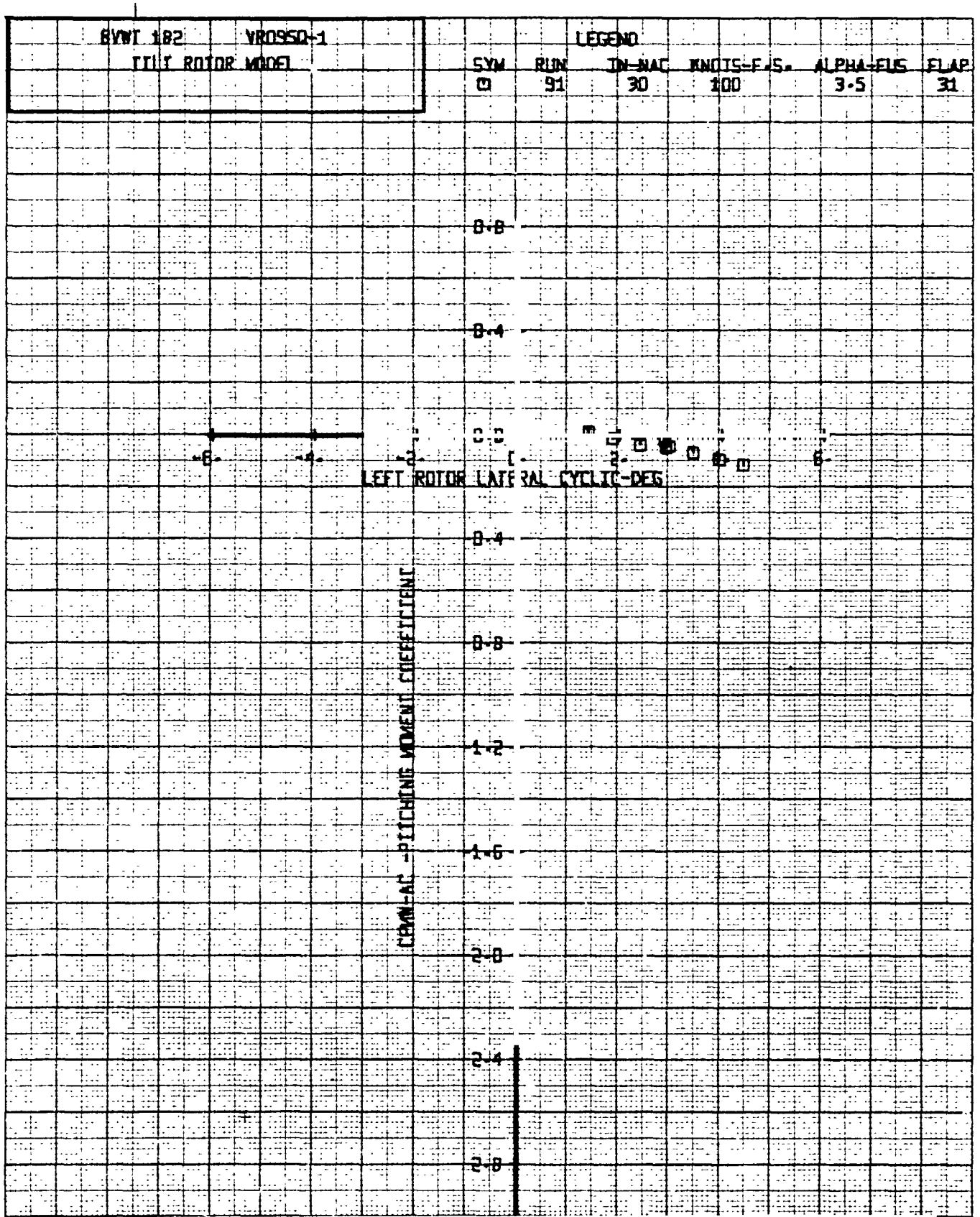


Figure 9-080. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = Full Scale Airspeed 100 Knots.

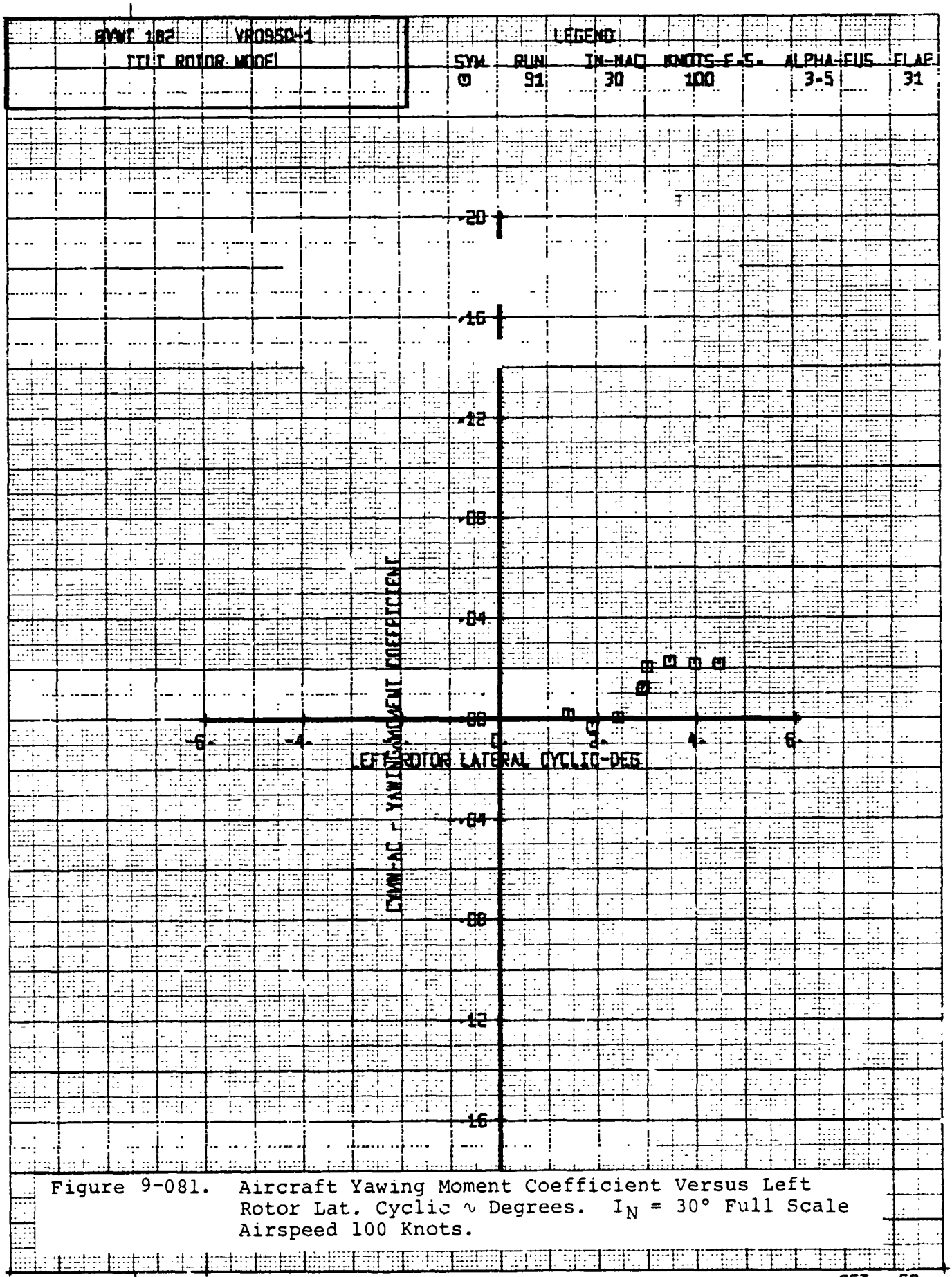


Figure 9-081. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

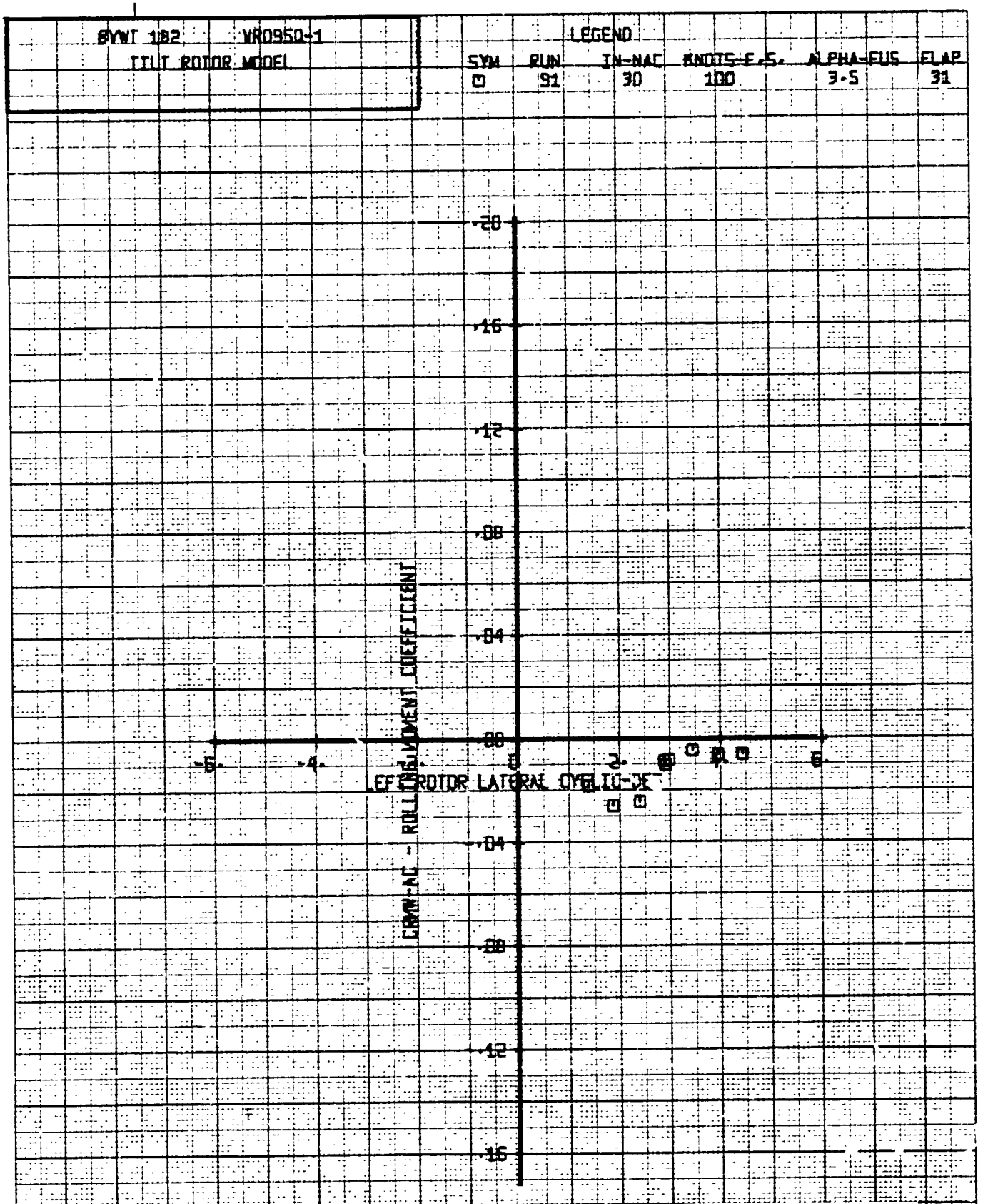


Figure 9-082. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

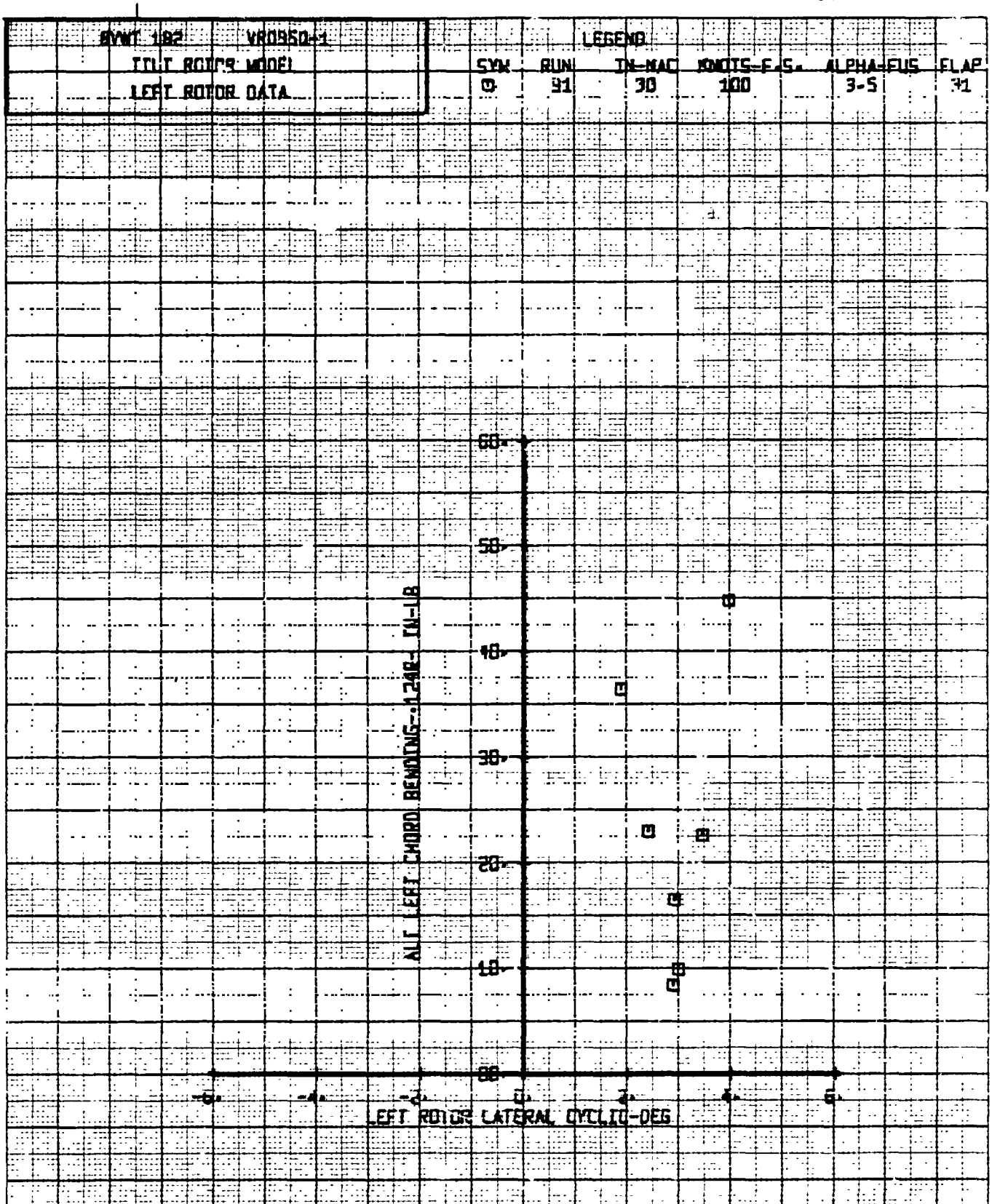


Figure 9-083. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

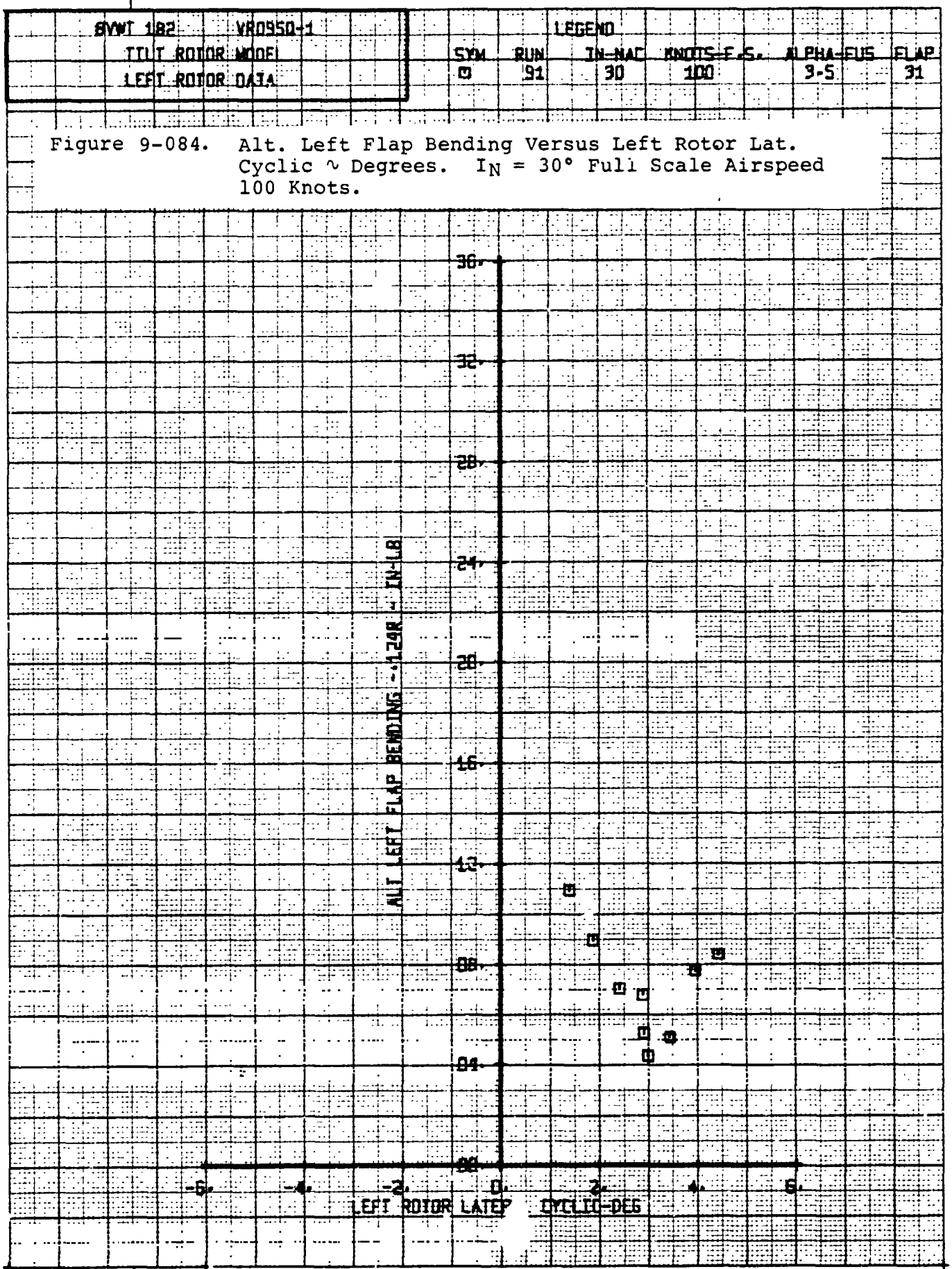


Figure 9-084. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

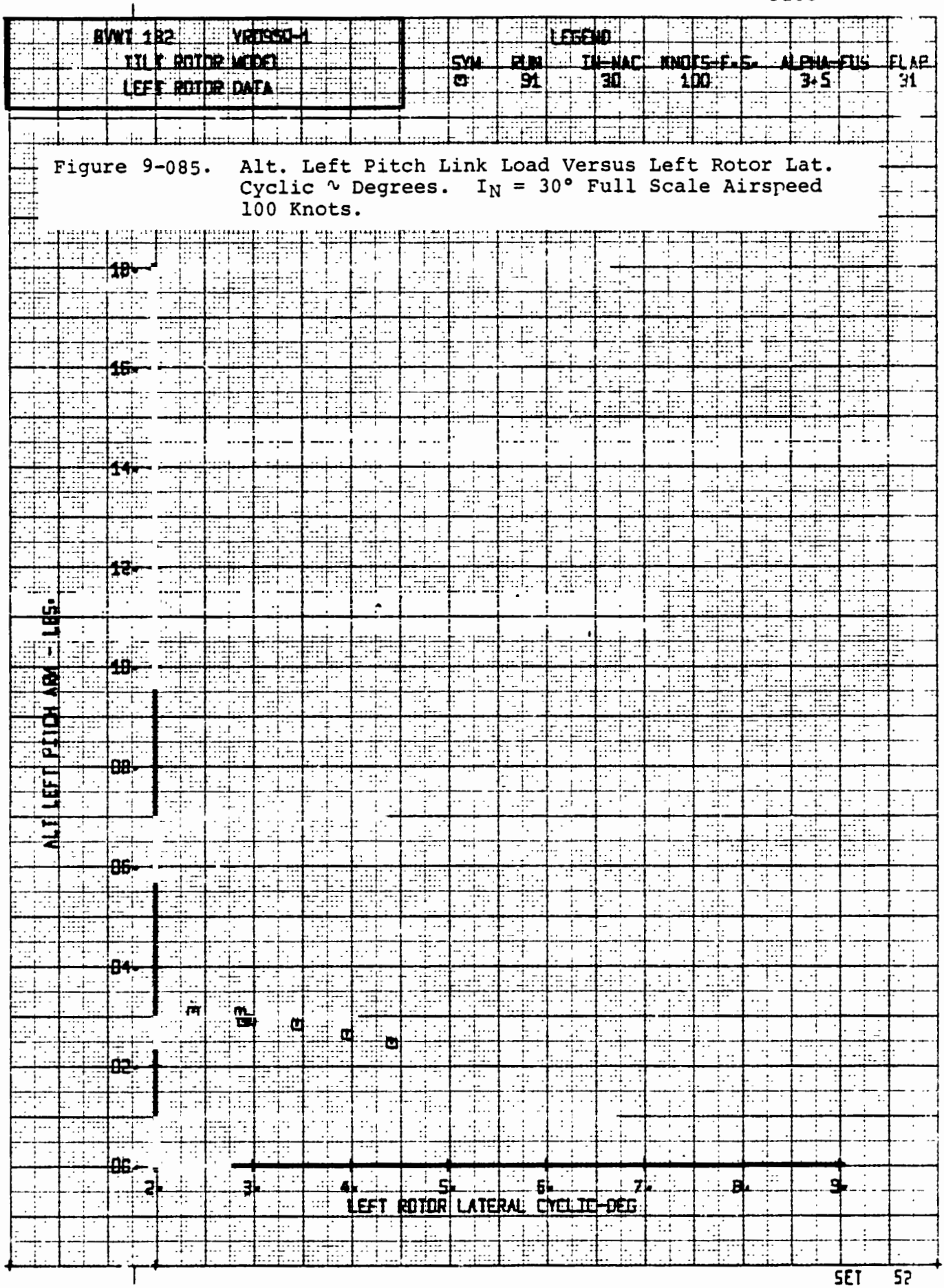


Figure 9-085. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

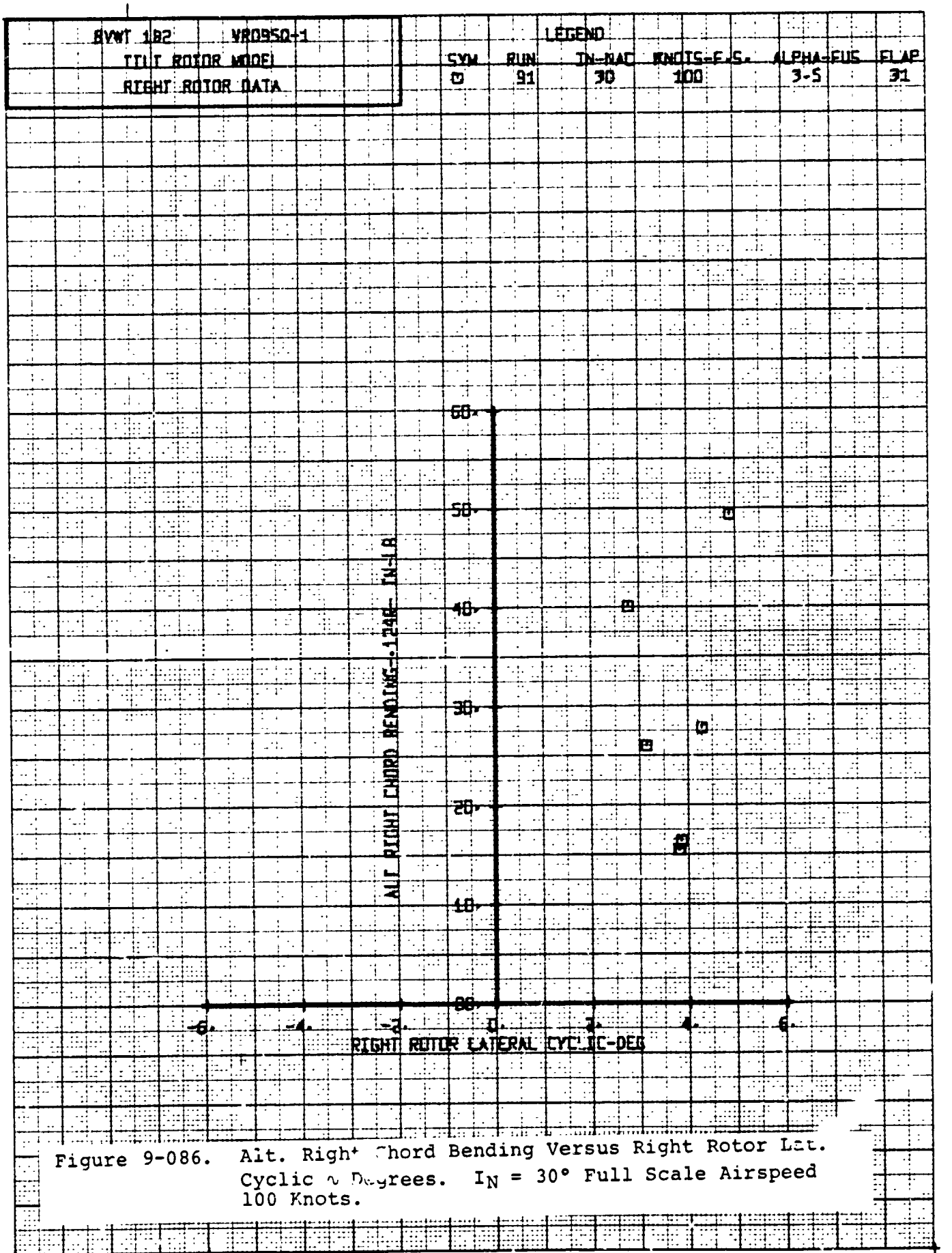


Figure 9-086. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

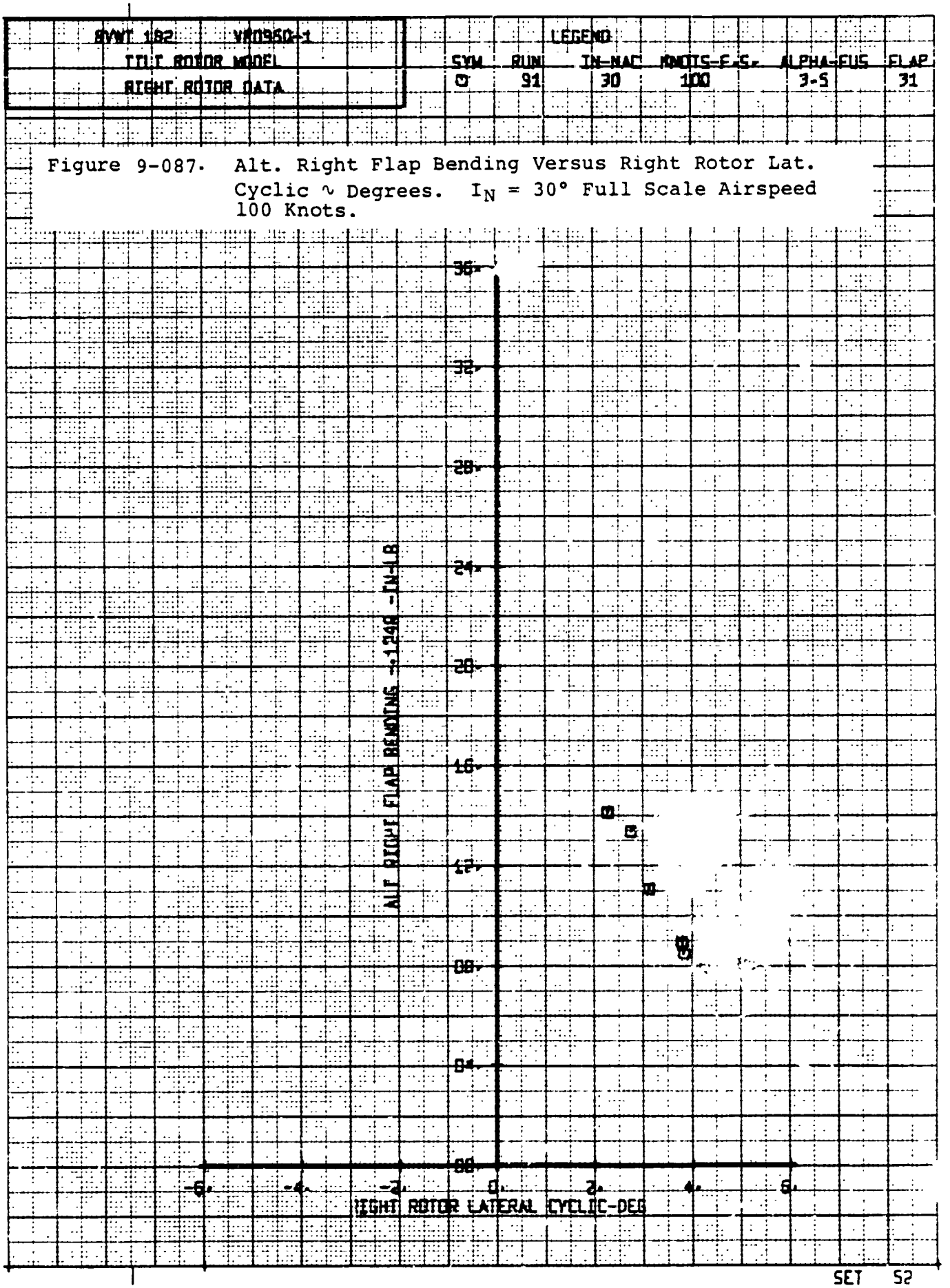
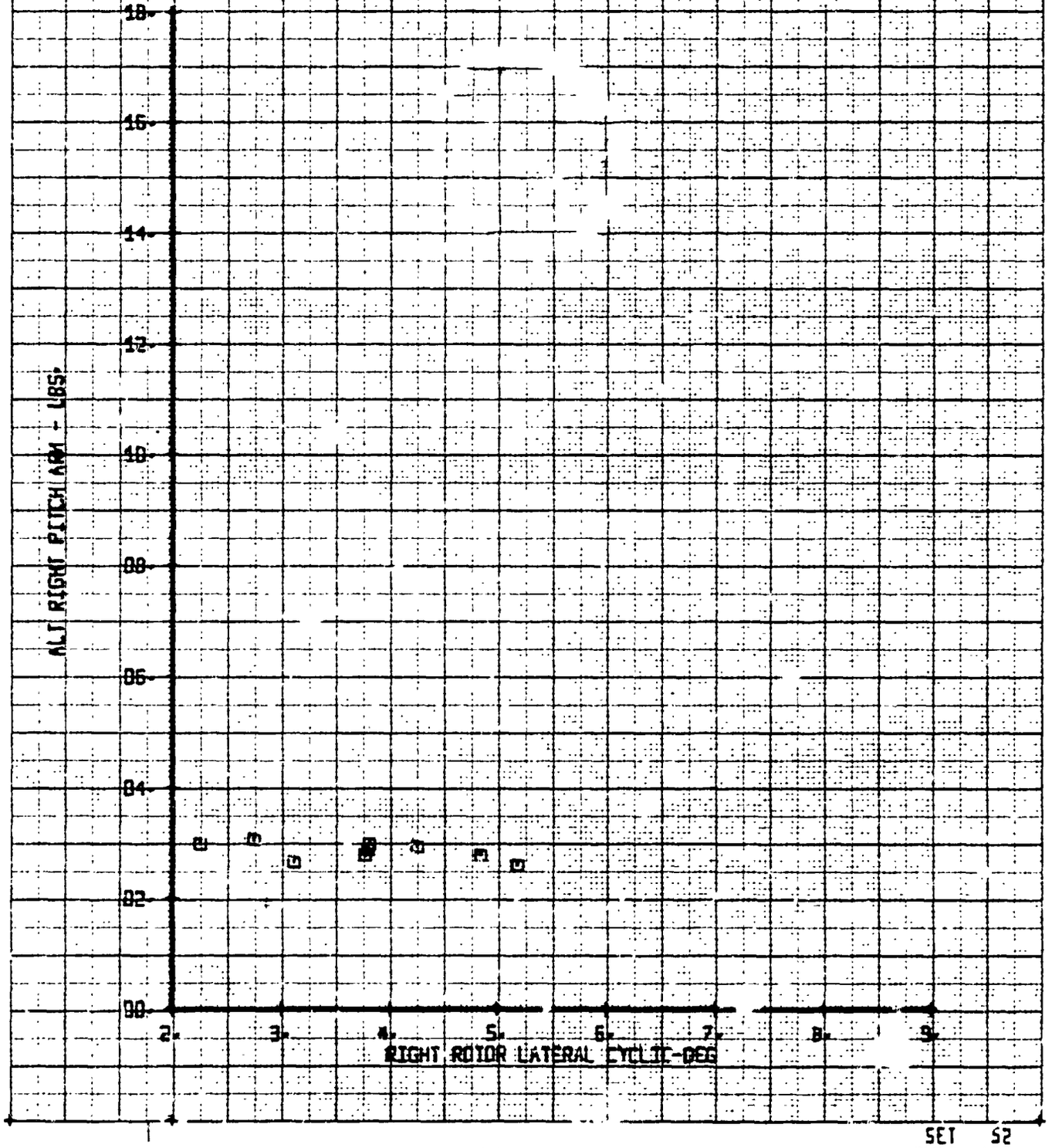


Figure 9-087. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

BVWI 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	91	30	100	3-5	31

Figure 9-088. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.



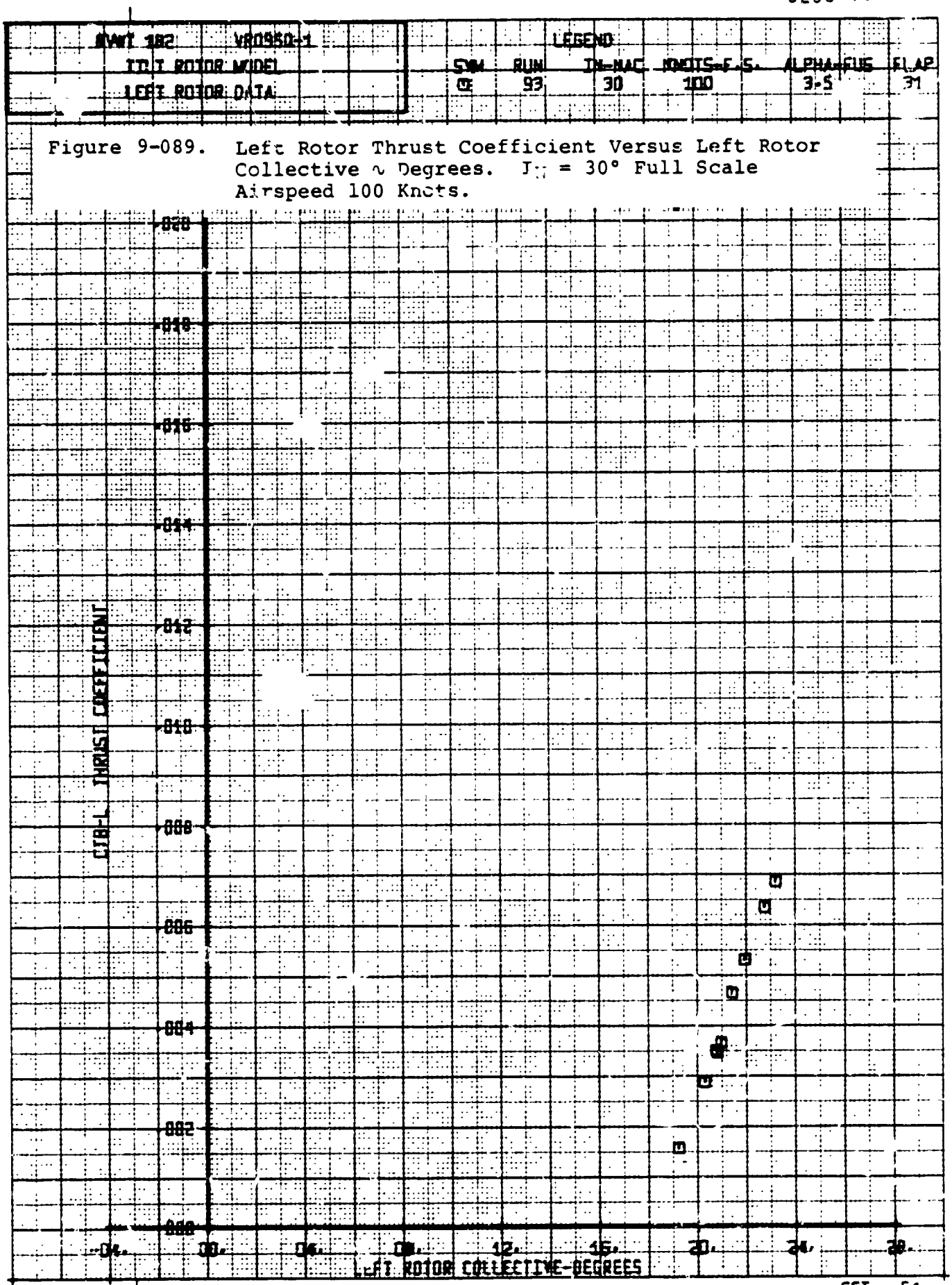


Figure 9-089. Left Rotor Thrust Coefficient Versus Left Rotor Collective ∿ Degrees. $J_{::}$ = 30° Full Scale Airspeed 100 Knots.

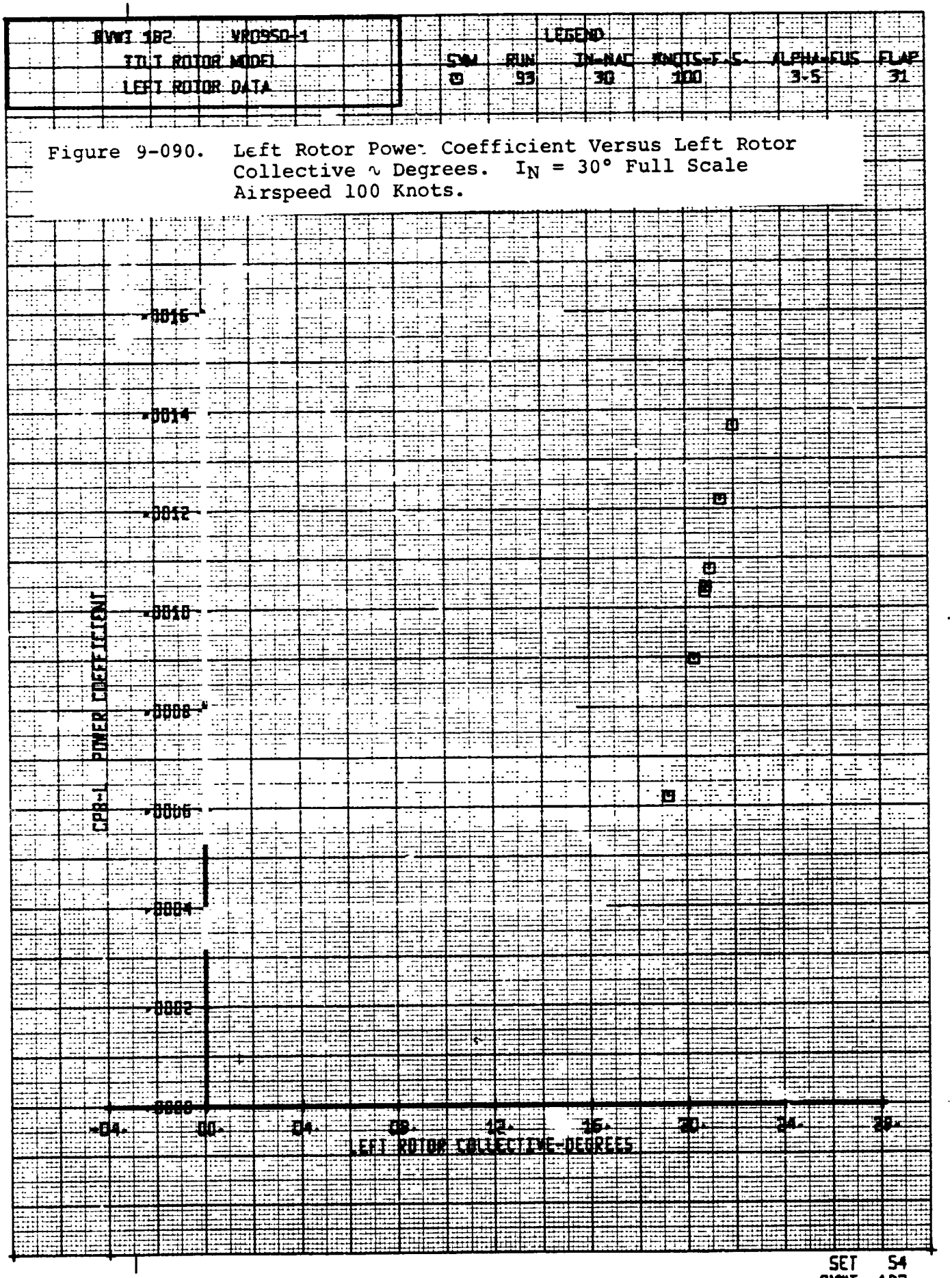


Figure 9-090. Left Rotor Power Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

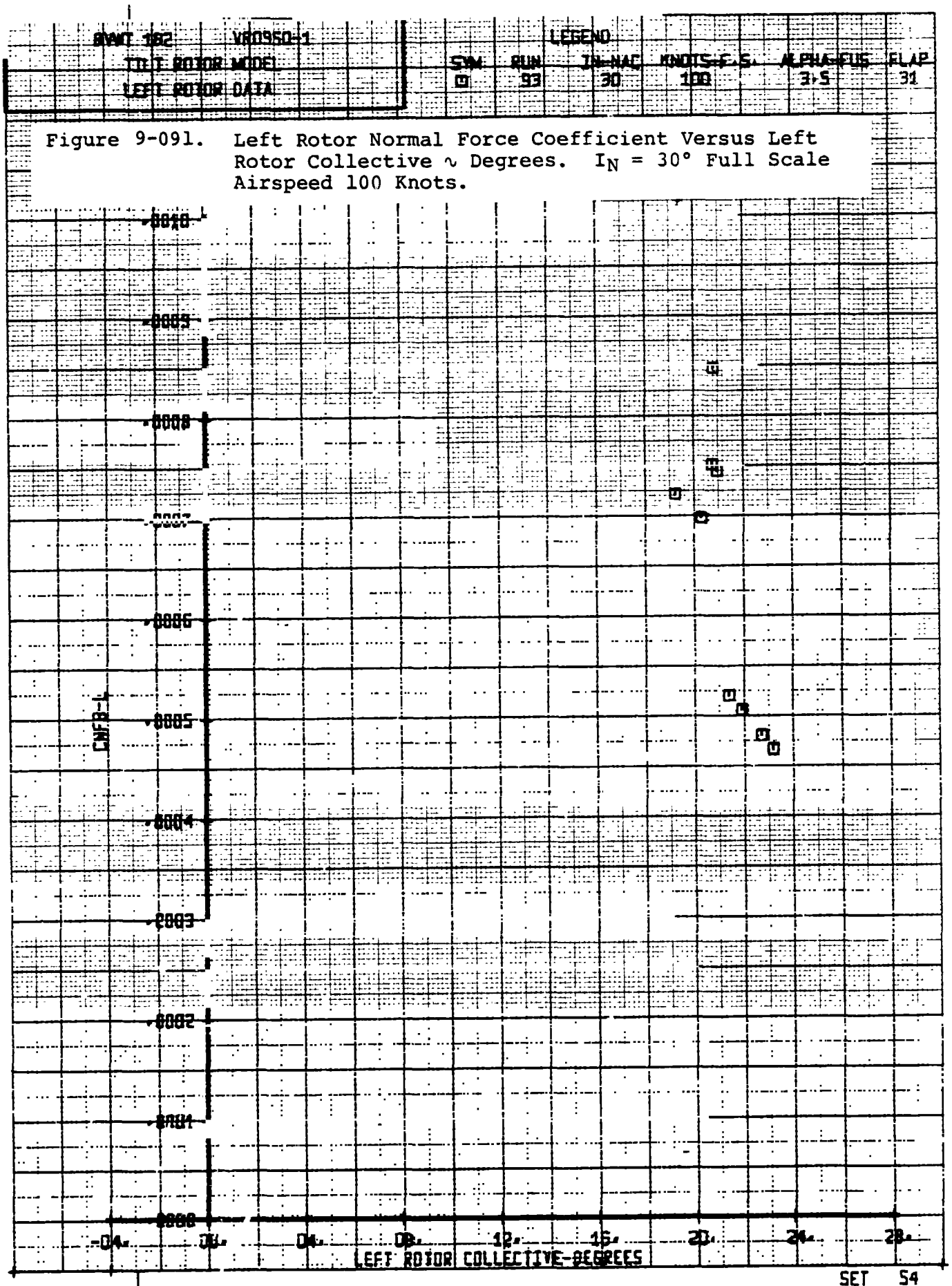


Figure 9-091. Left Rotor Normal Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

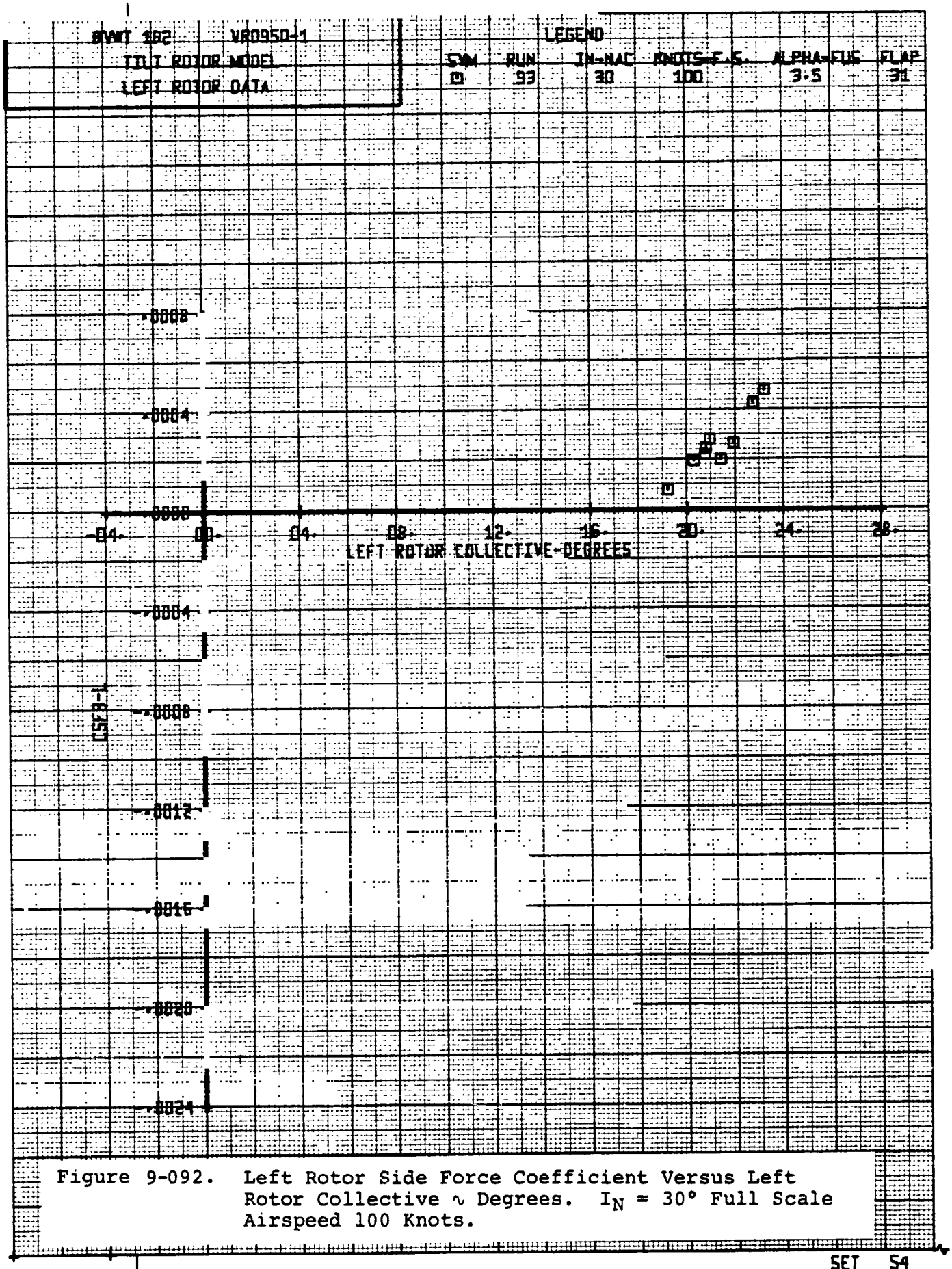


Figure 9-092. Left Rotor Side Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

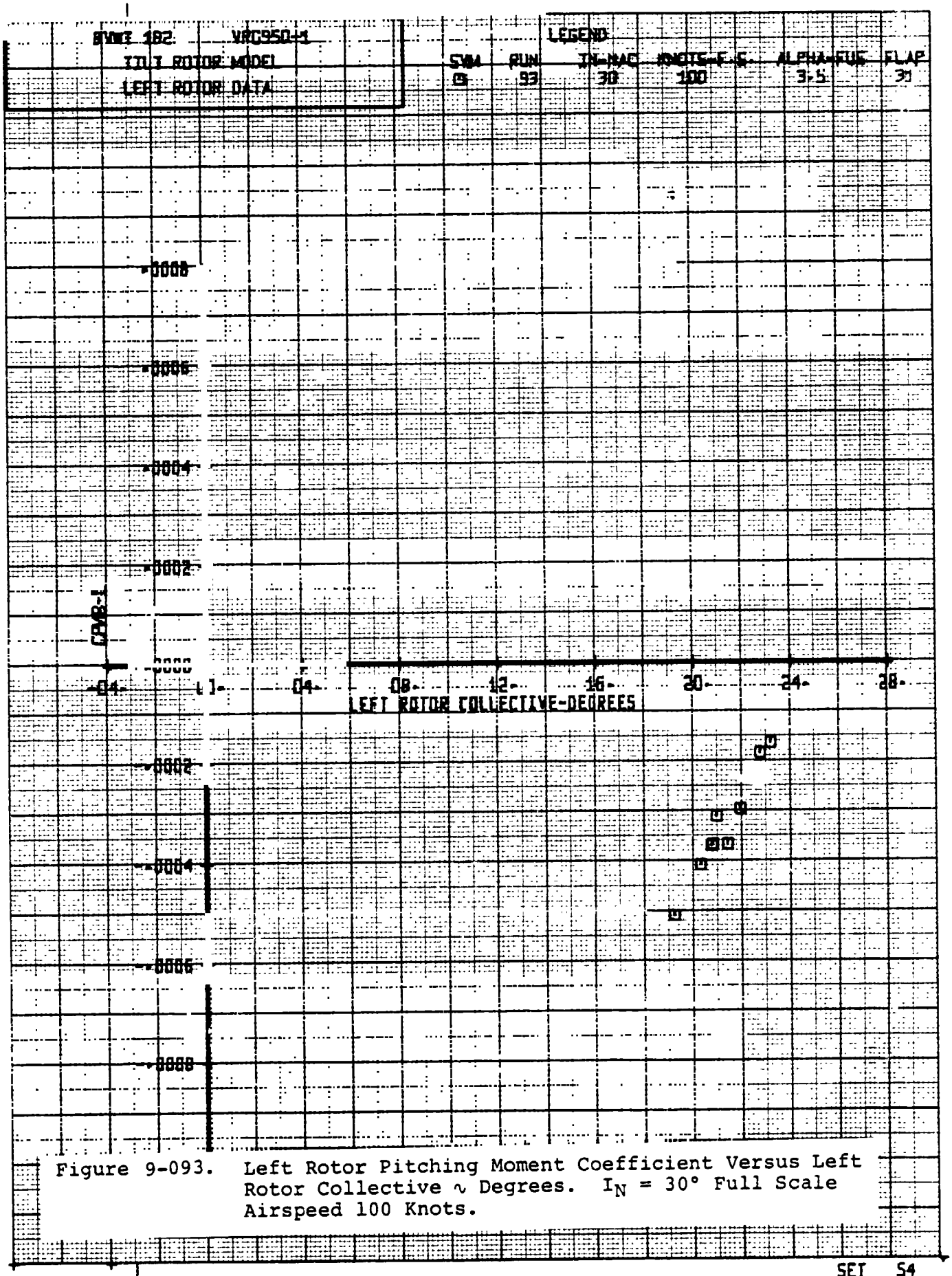


Figure 9-093. Left Rotor Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

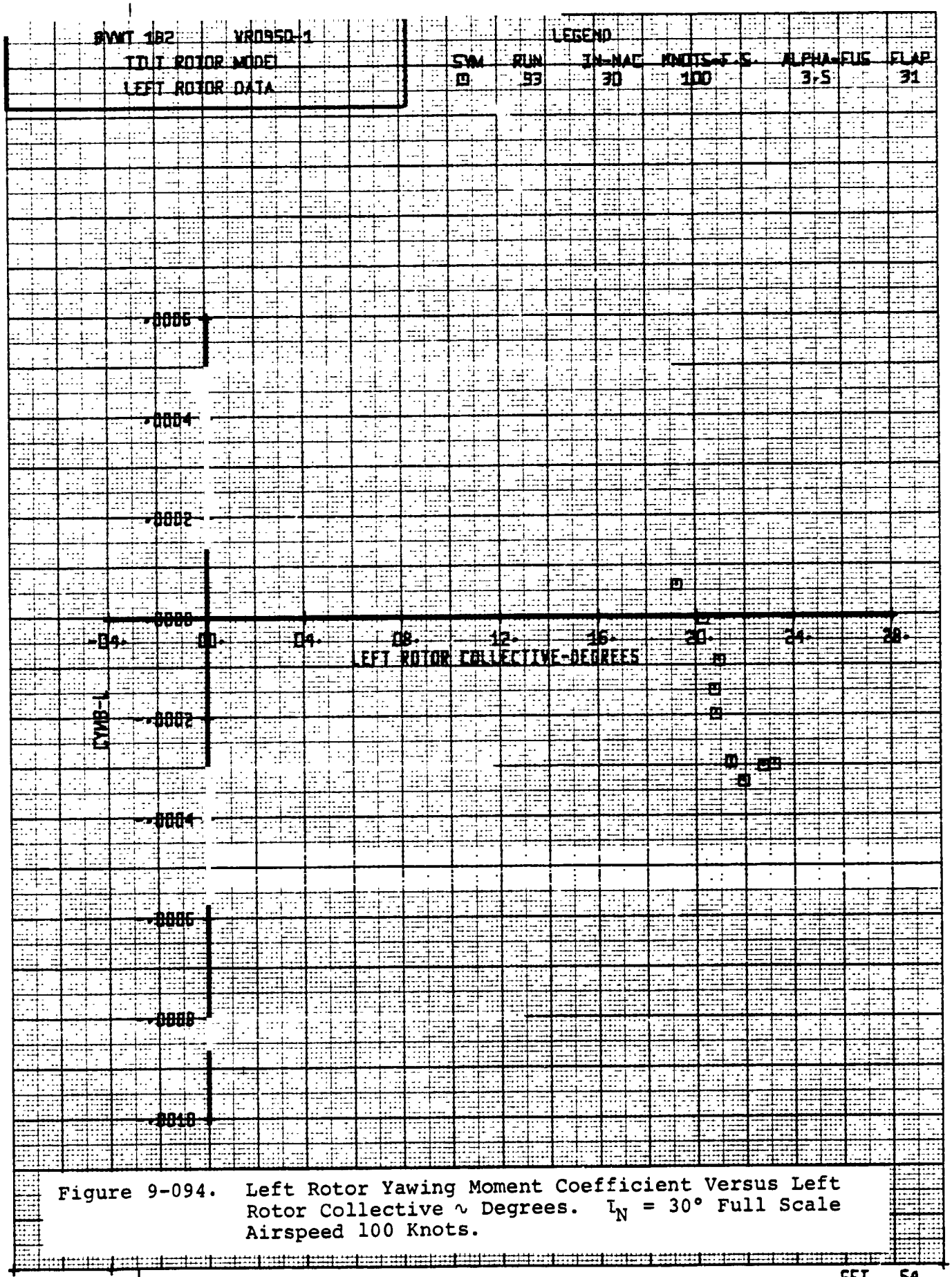
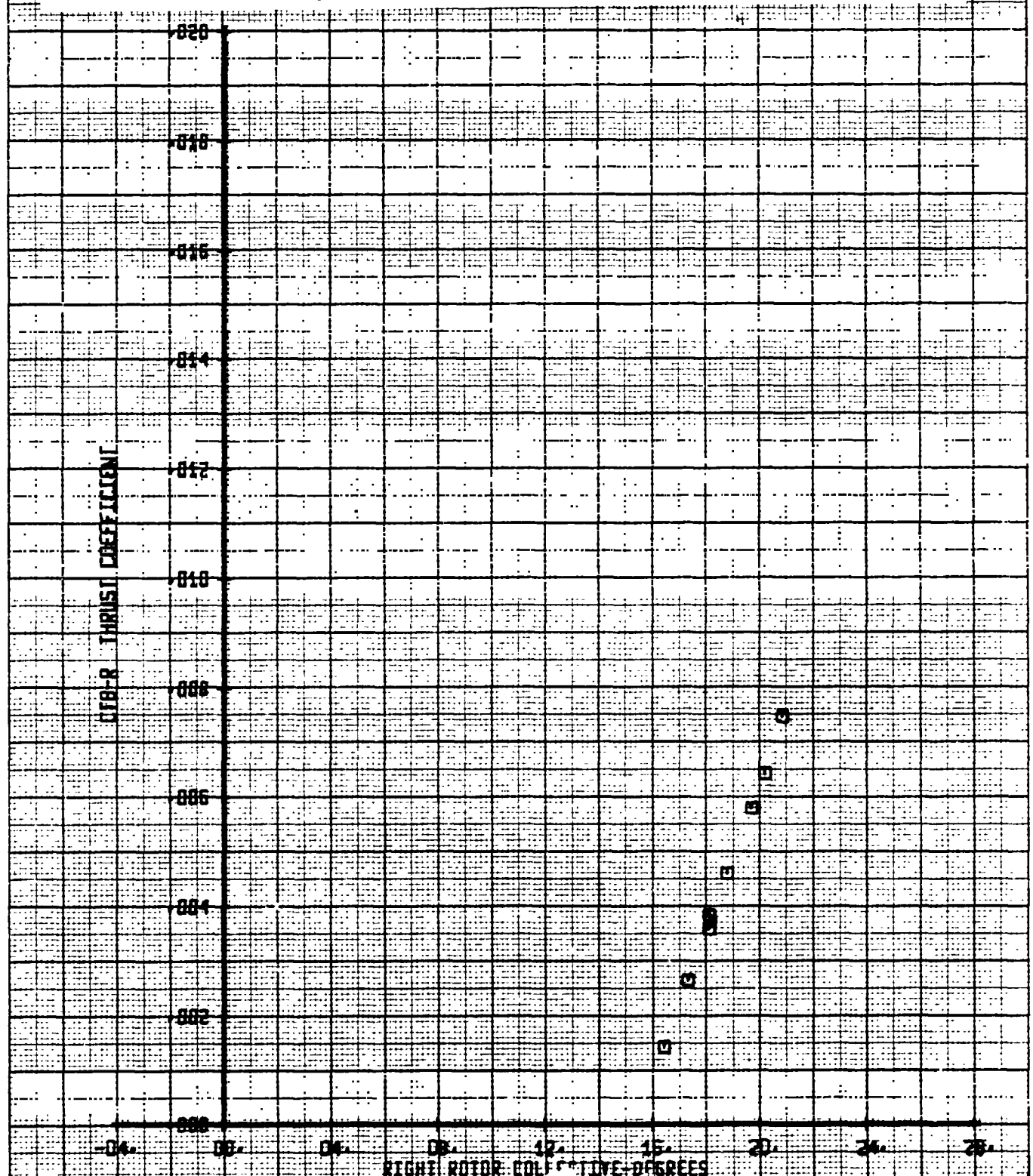


Figure 9-094. Left Rotor Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
	□	93	30	100	3.5	31

Figure 9-095. Right Rotor Thrust Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.



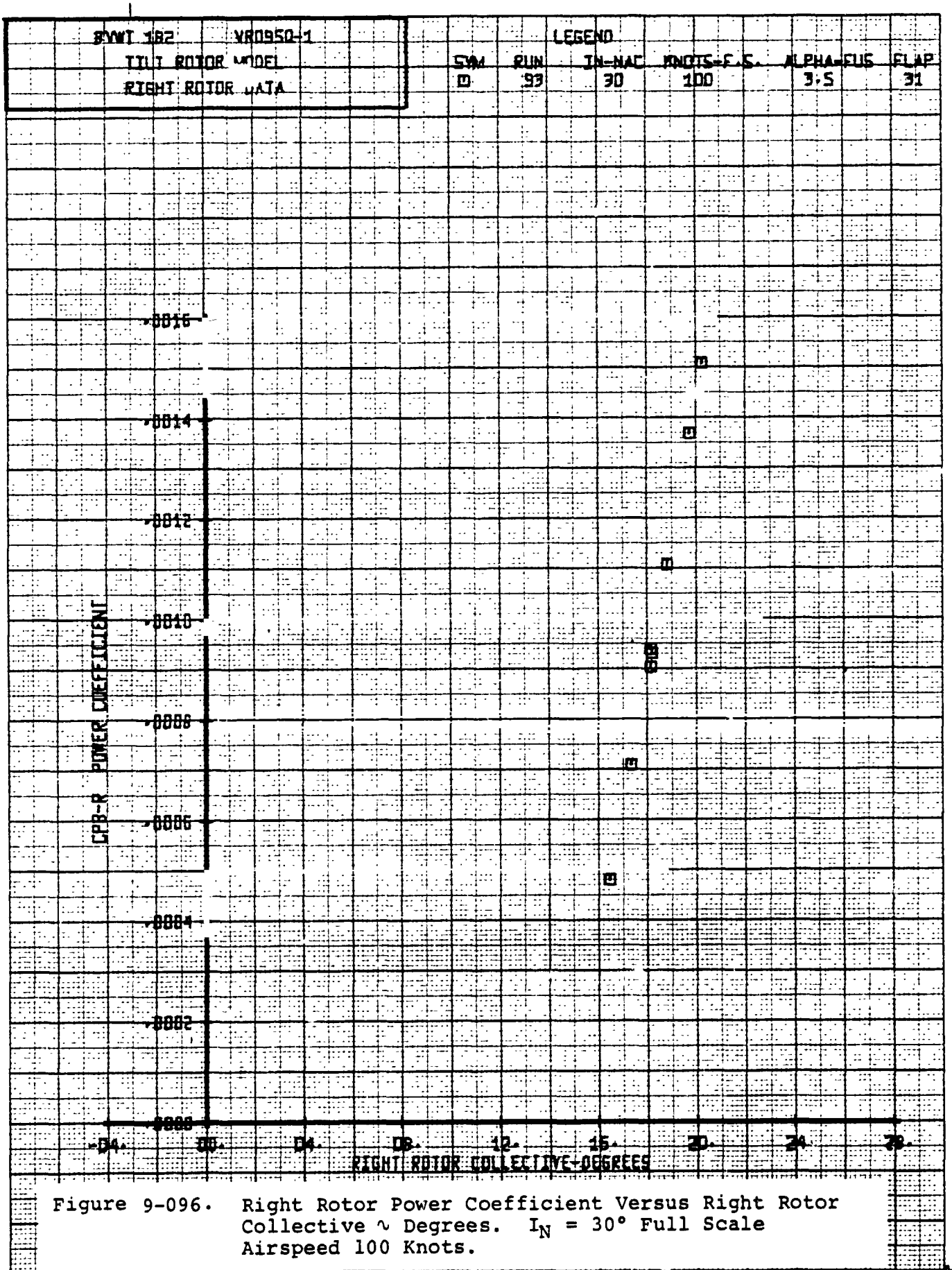


Figure 9-096. Right Rotor Power Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

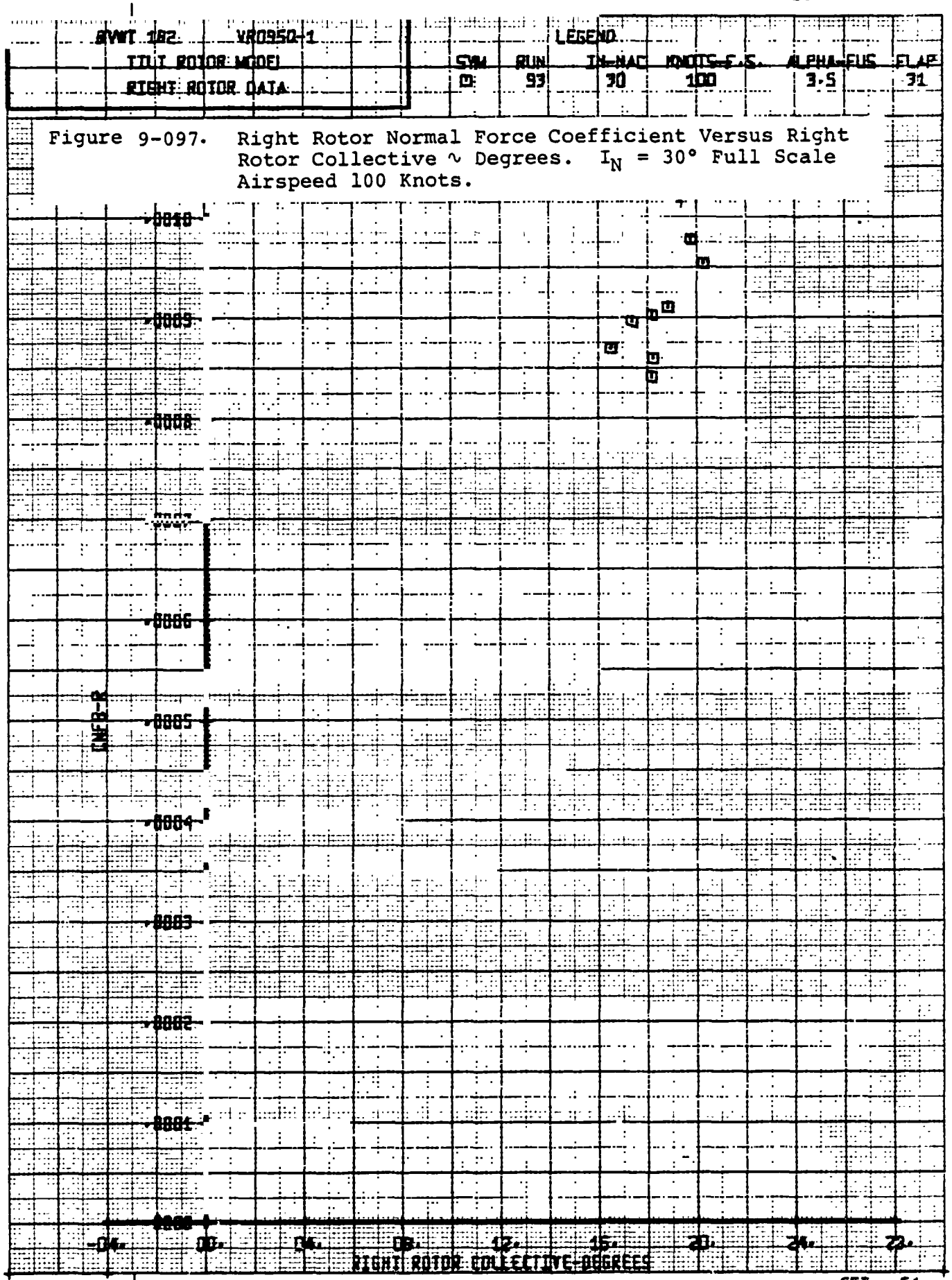


Figure 9-097. Right Rotor Normal Force Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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Refer to Section 3.0

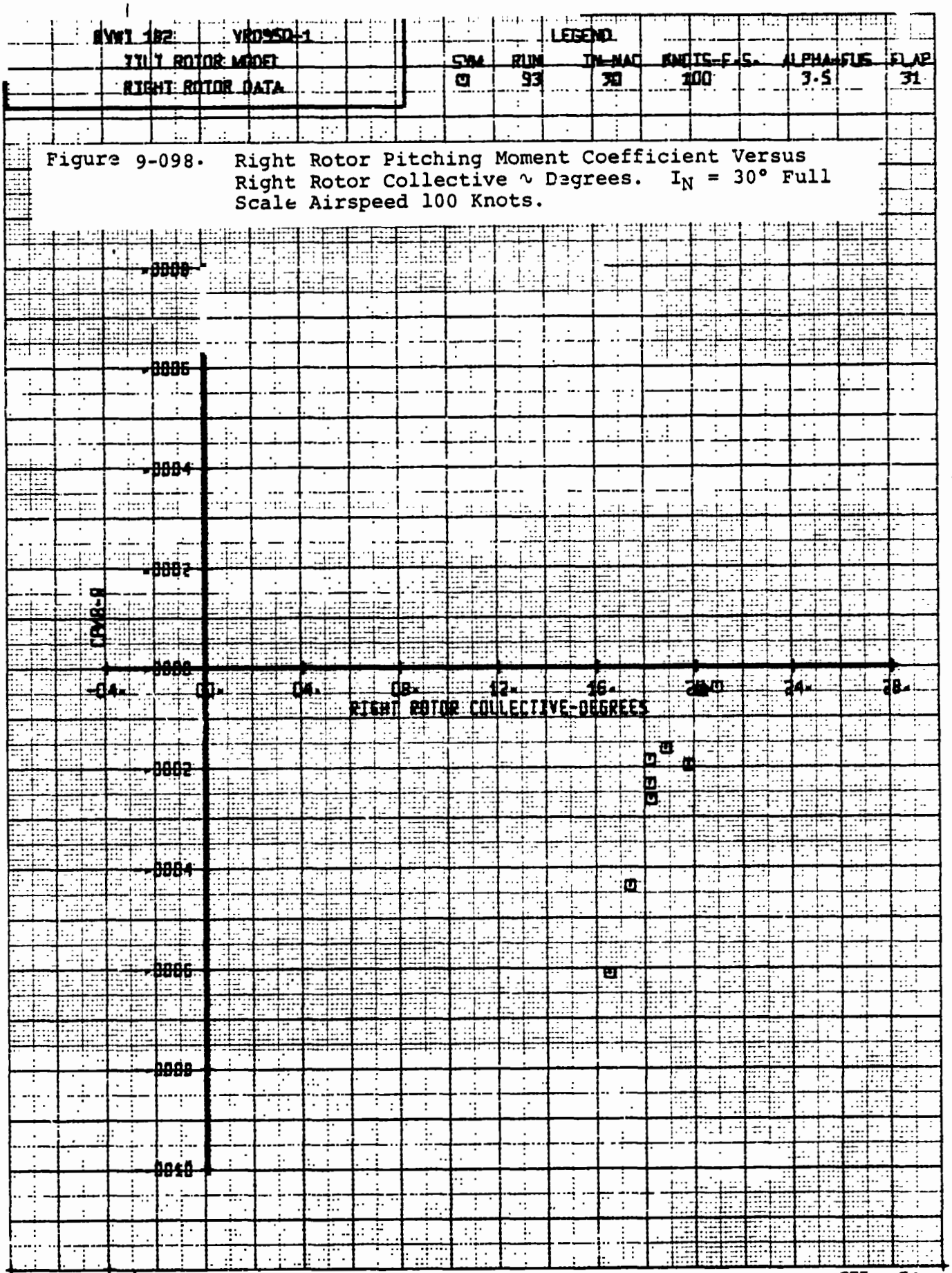

Figure 9-098. Right Rotor Pitching Moment Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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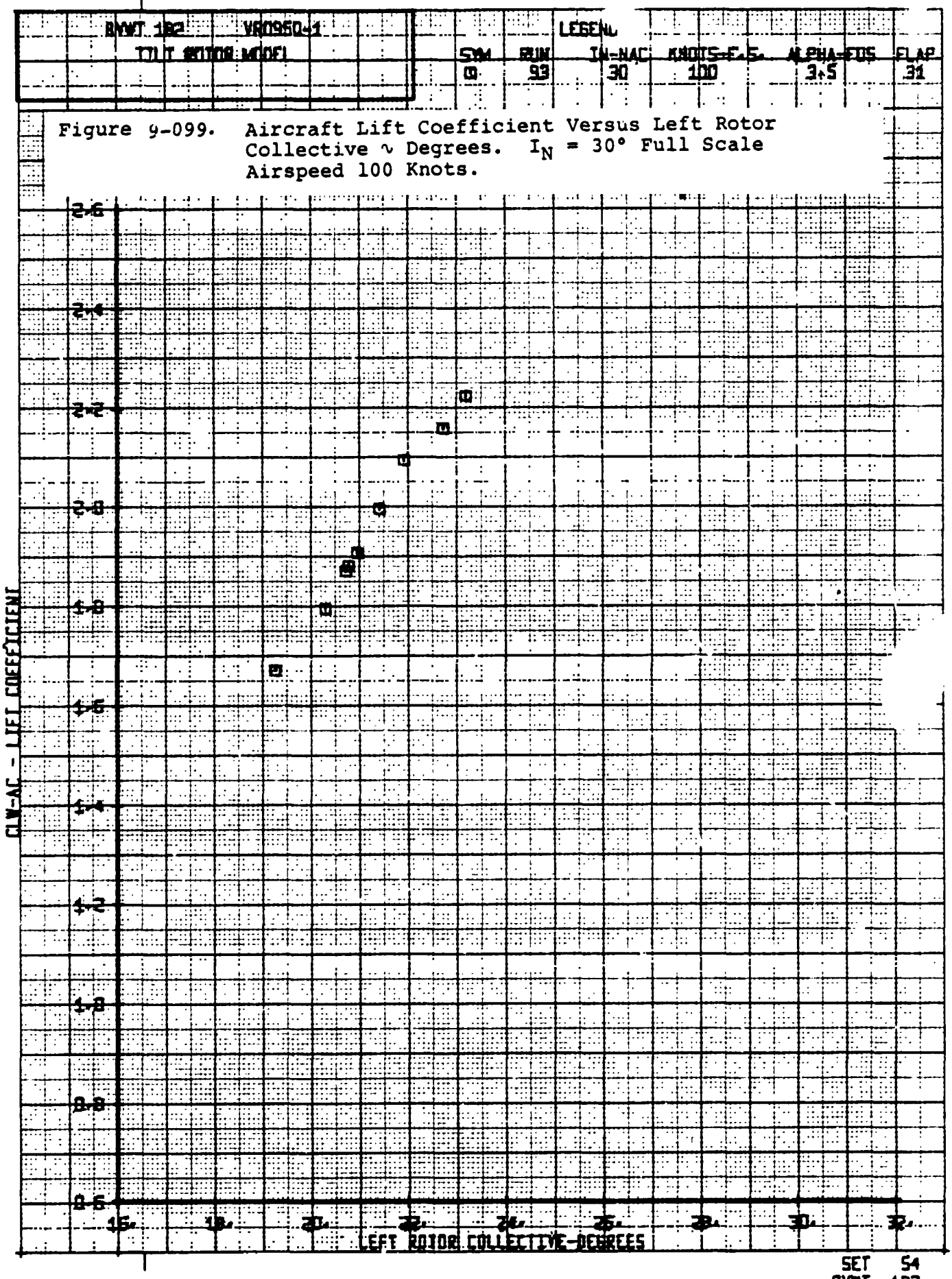

Figure 9-099. Aircraft Lift Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

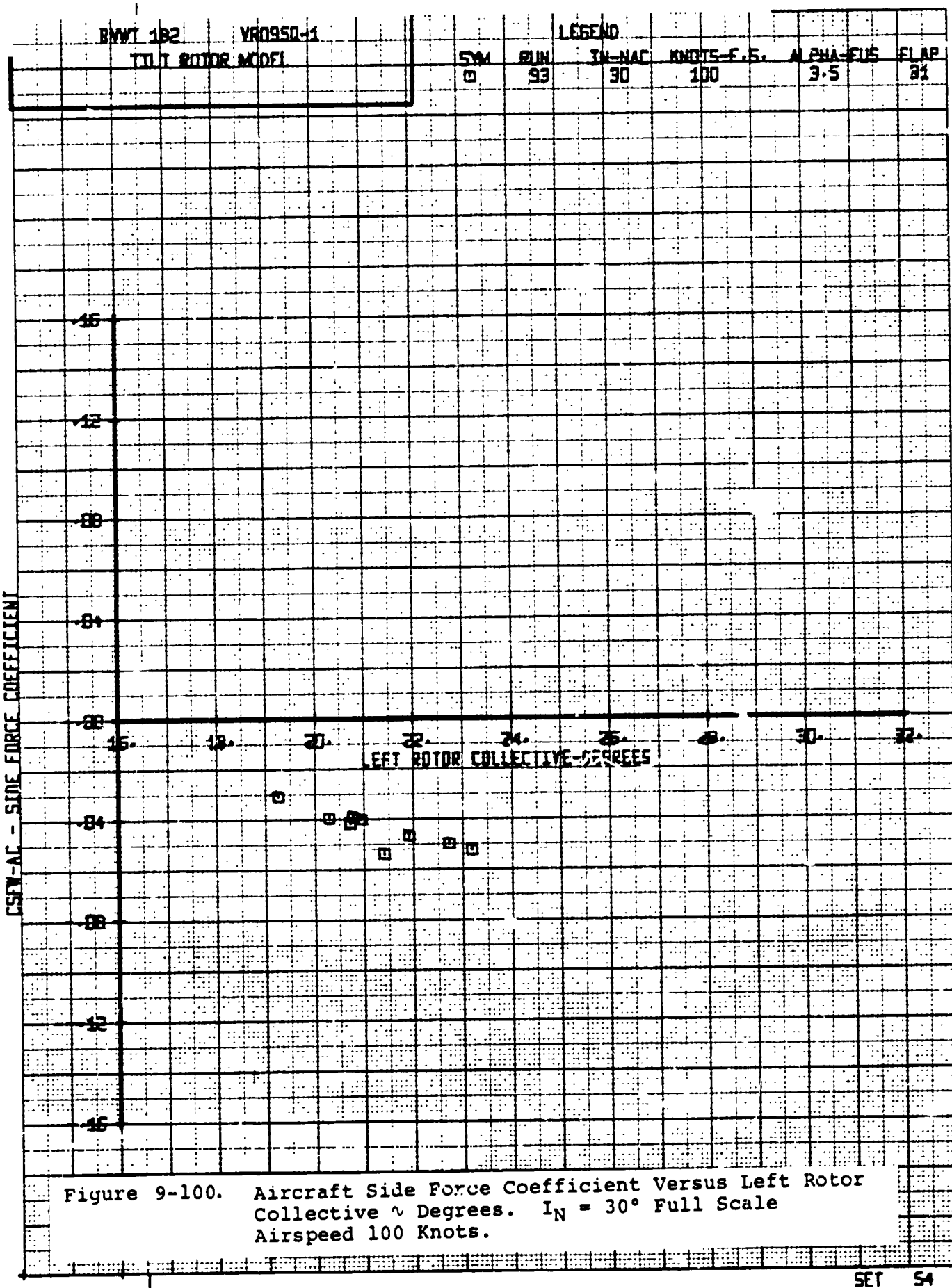

Figure 9-100. Aircraft Side Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

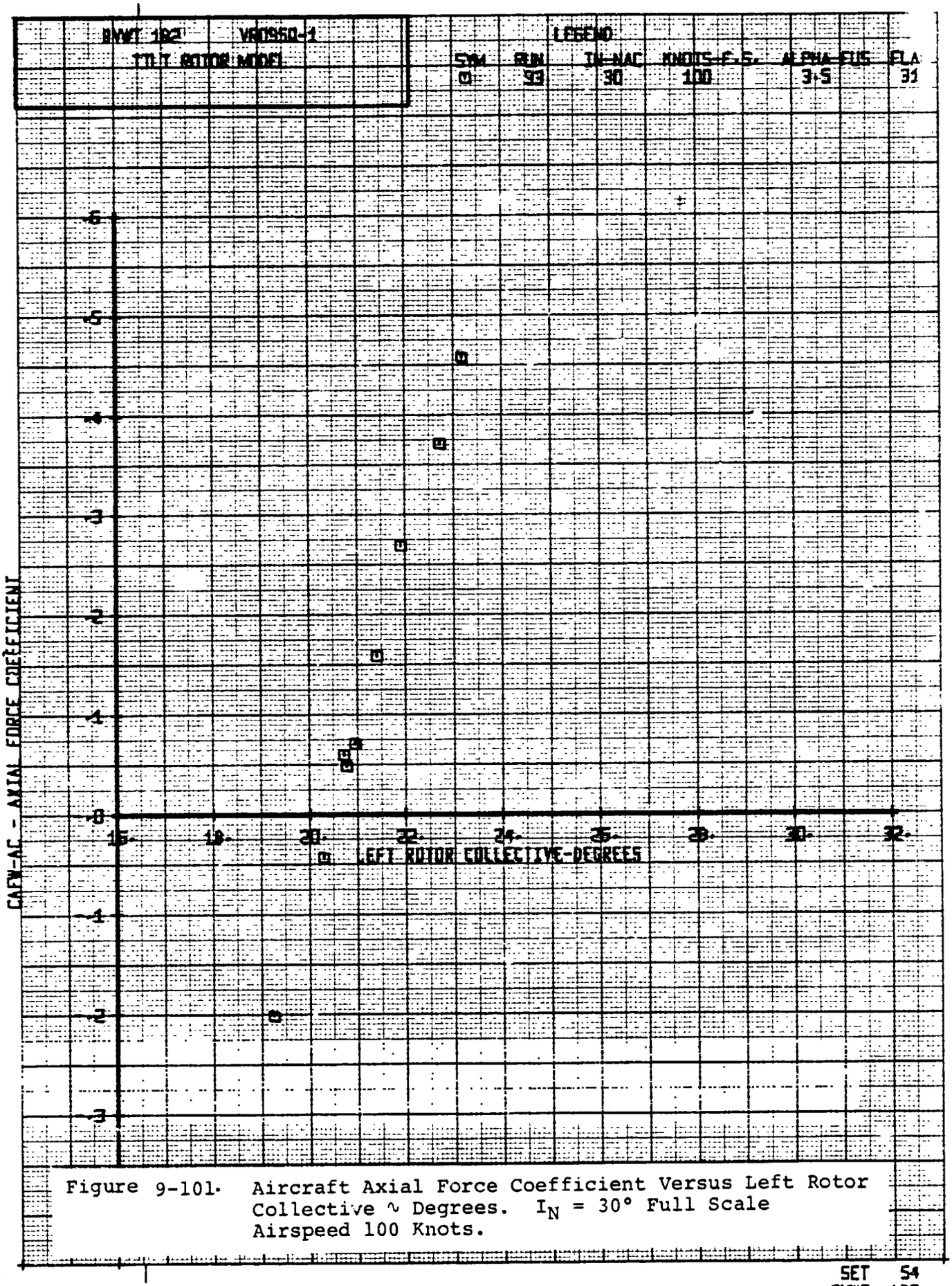

Figure 9-101. Aircraft Axial Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

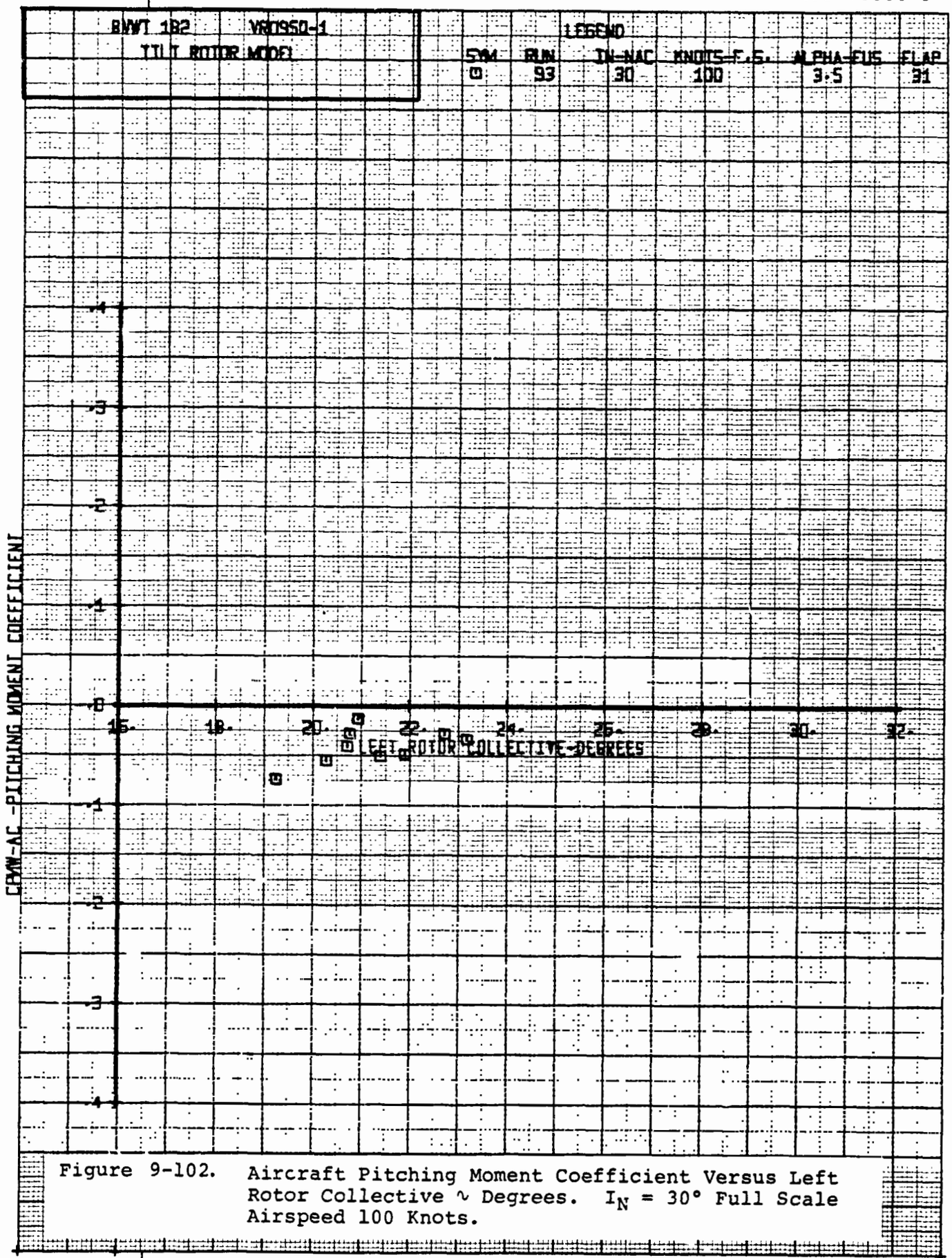

Figure 9-102. Aircraft Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

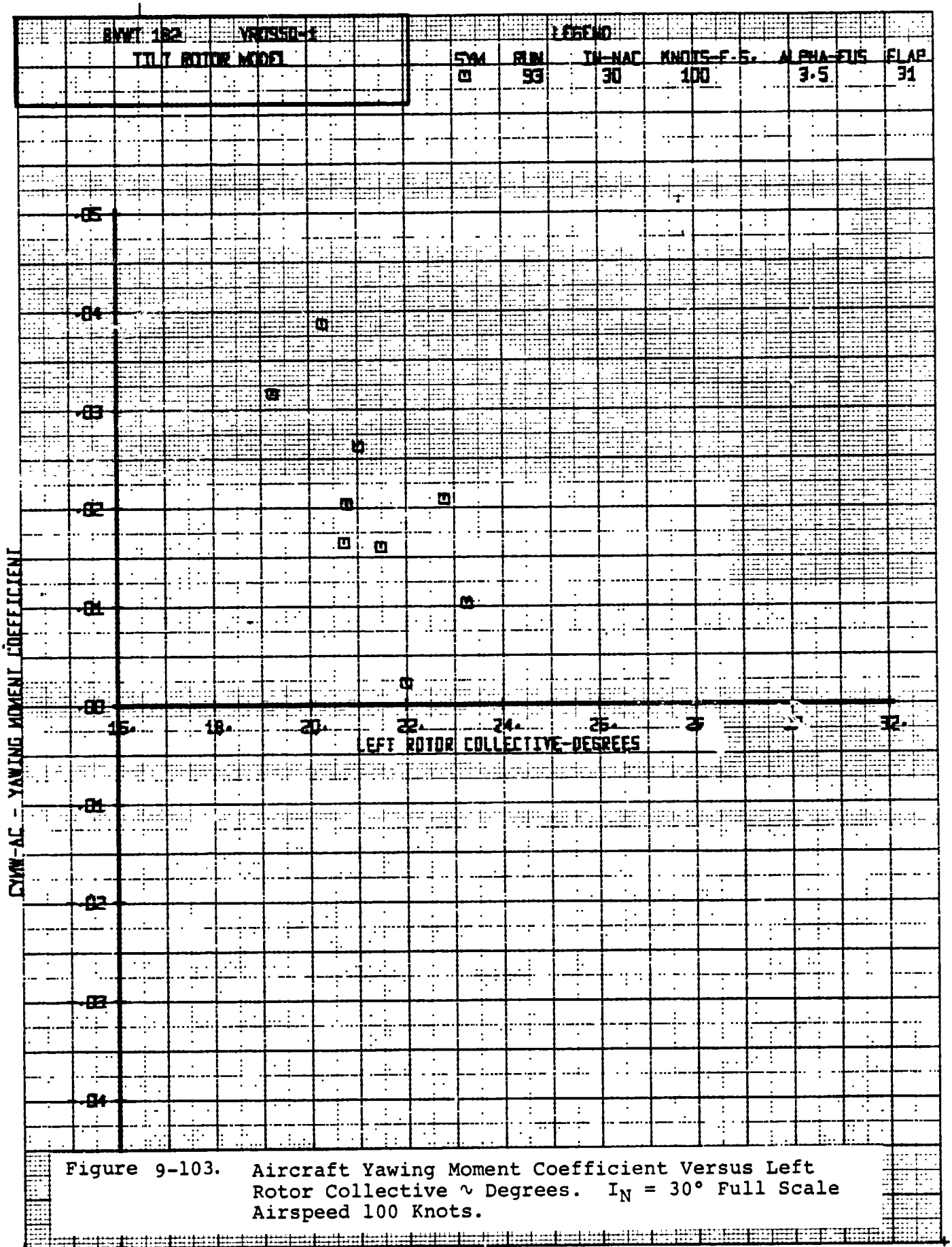

Figure 9-103. Aircraft Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

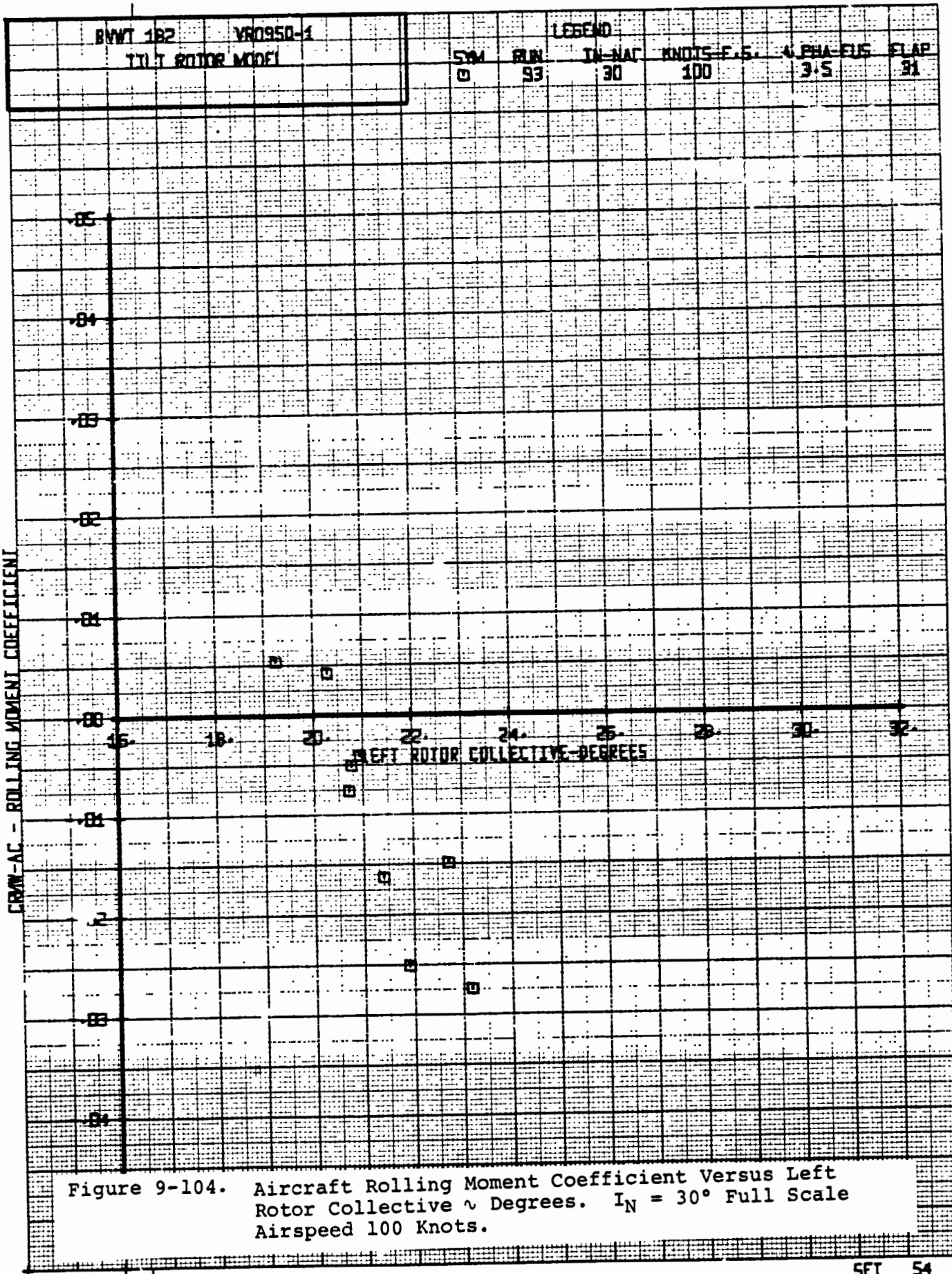

Figure 9-104. Aircraft Rolling Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

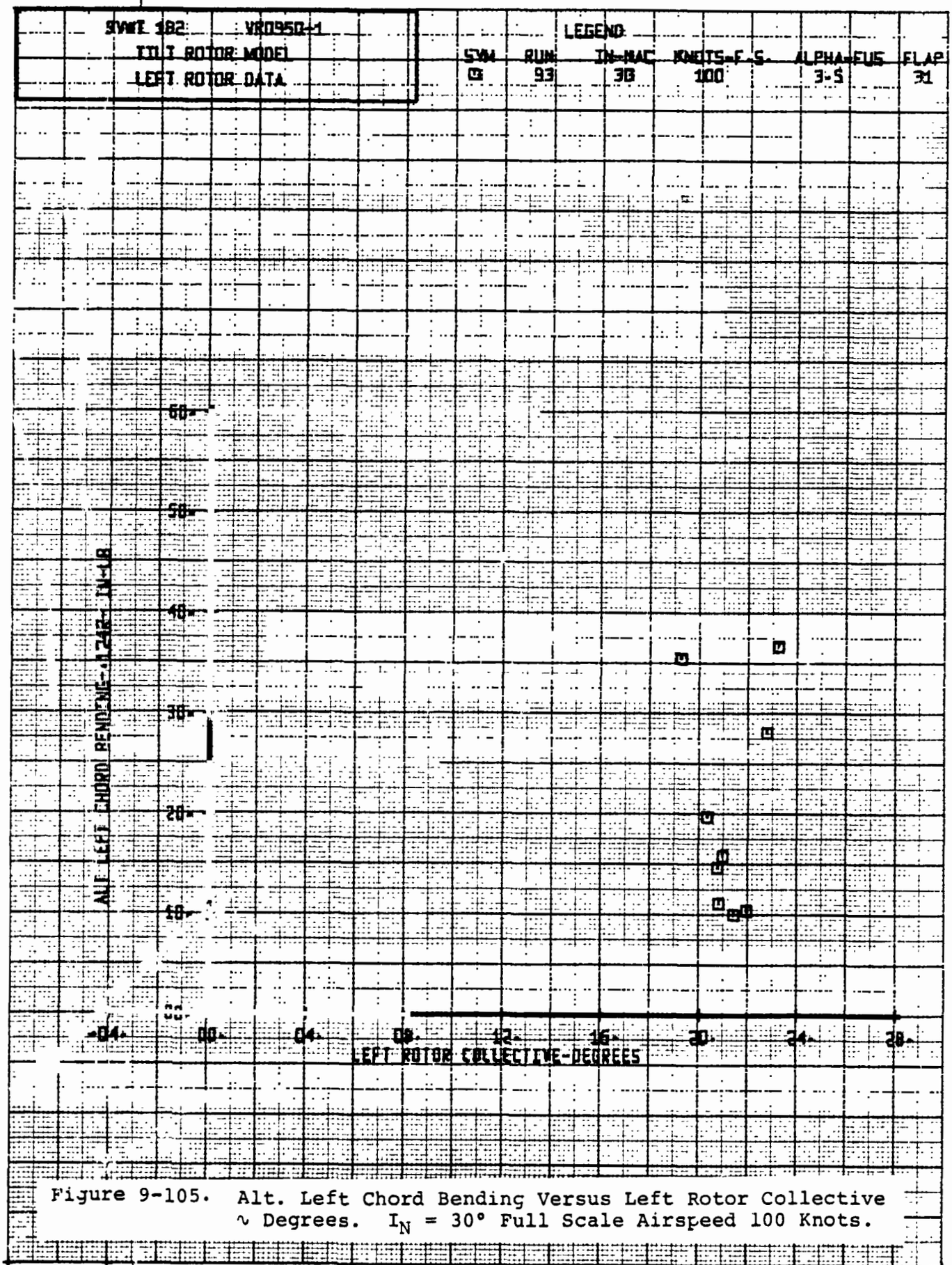

Figure 9-105. Alt. Left Chord Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

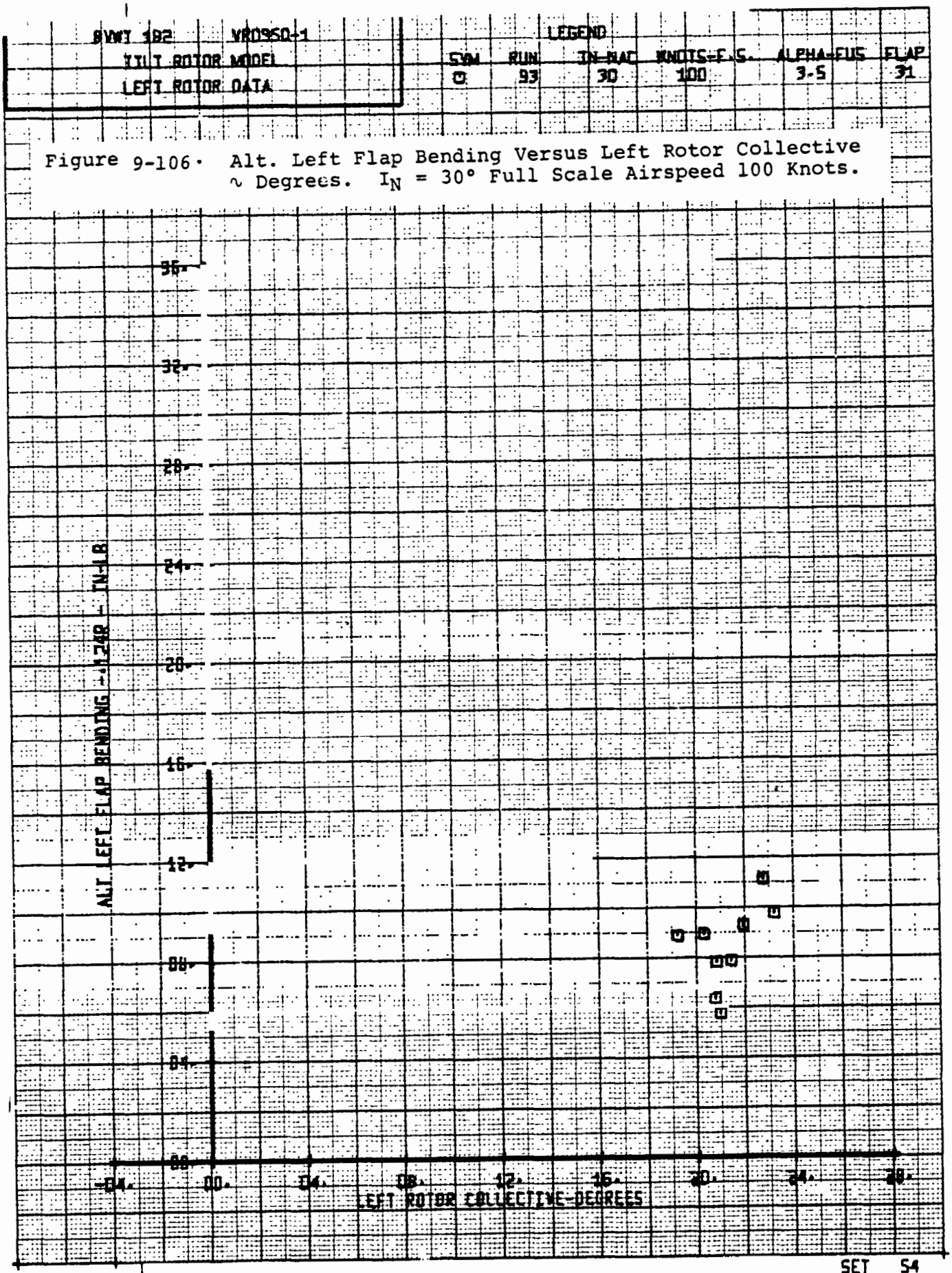

Figure 9-106. Alt. Left Flap Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

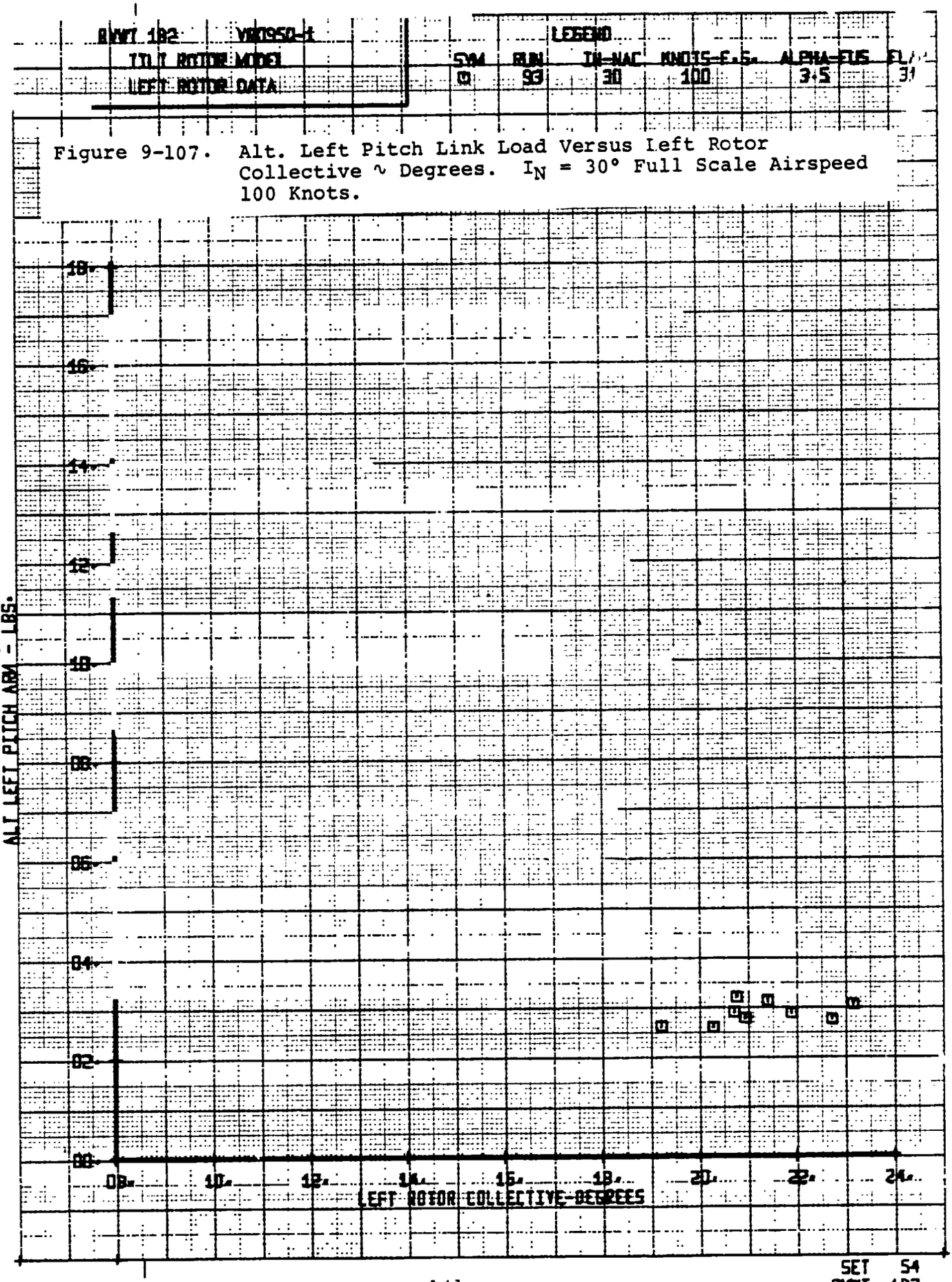

Figure 9-107. Alt. Left Pitch Link Load Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

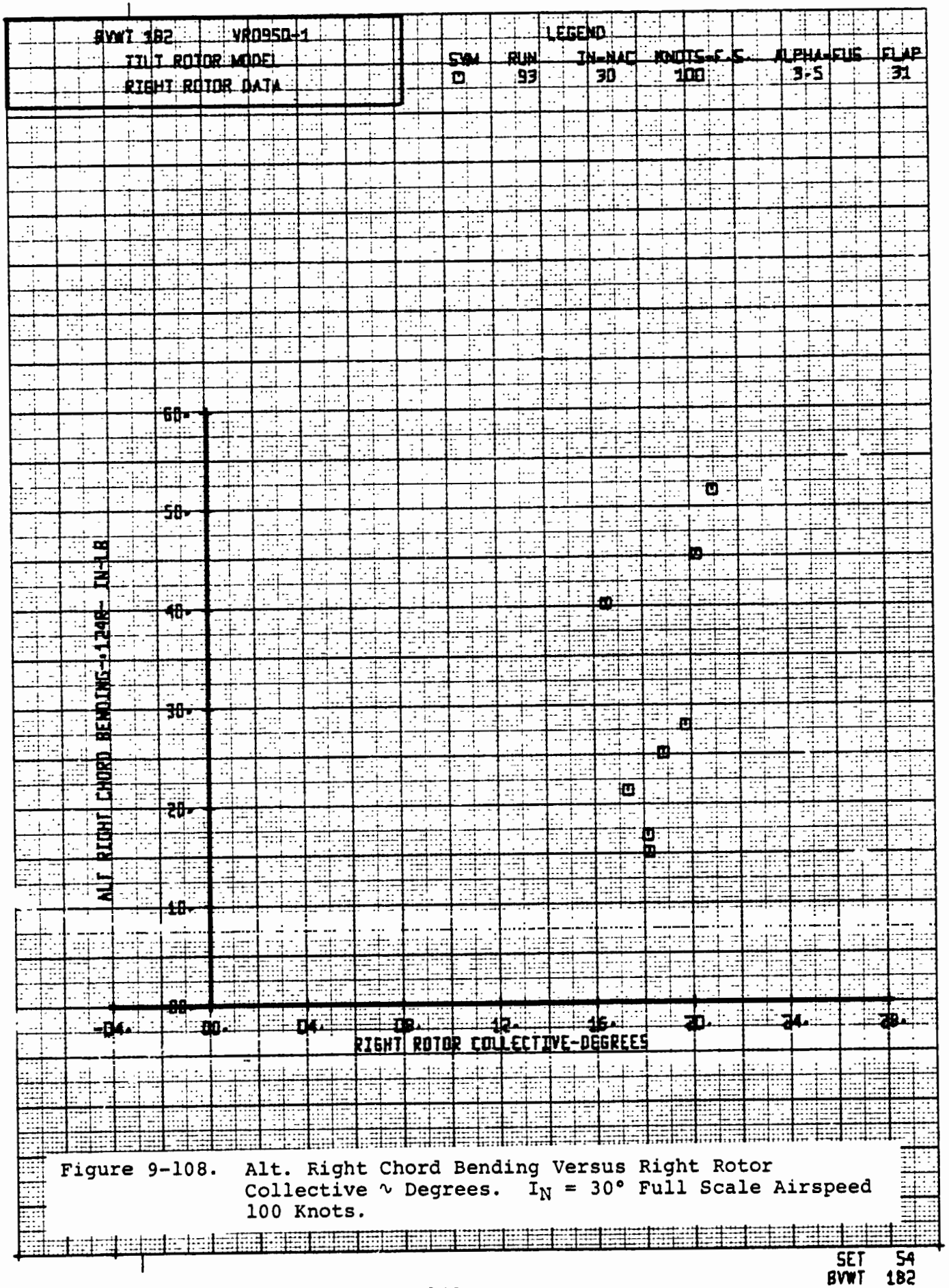

Figure 9-108. Alt. Right Chord Bending Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

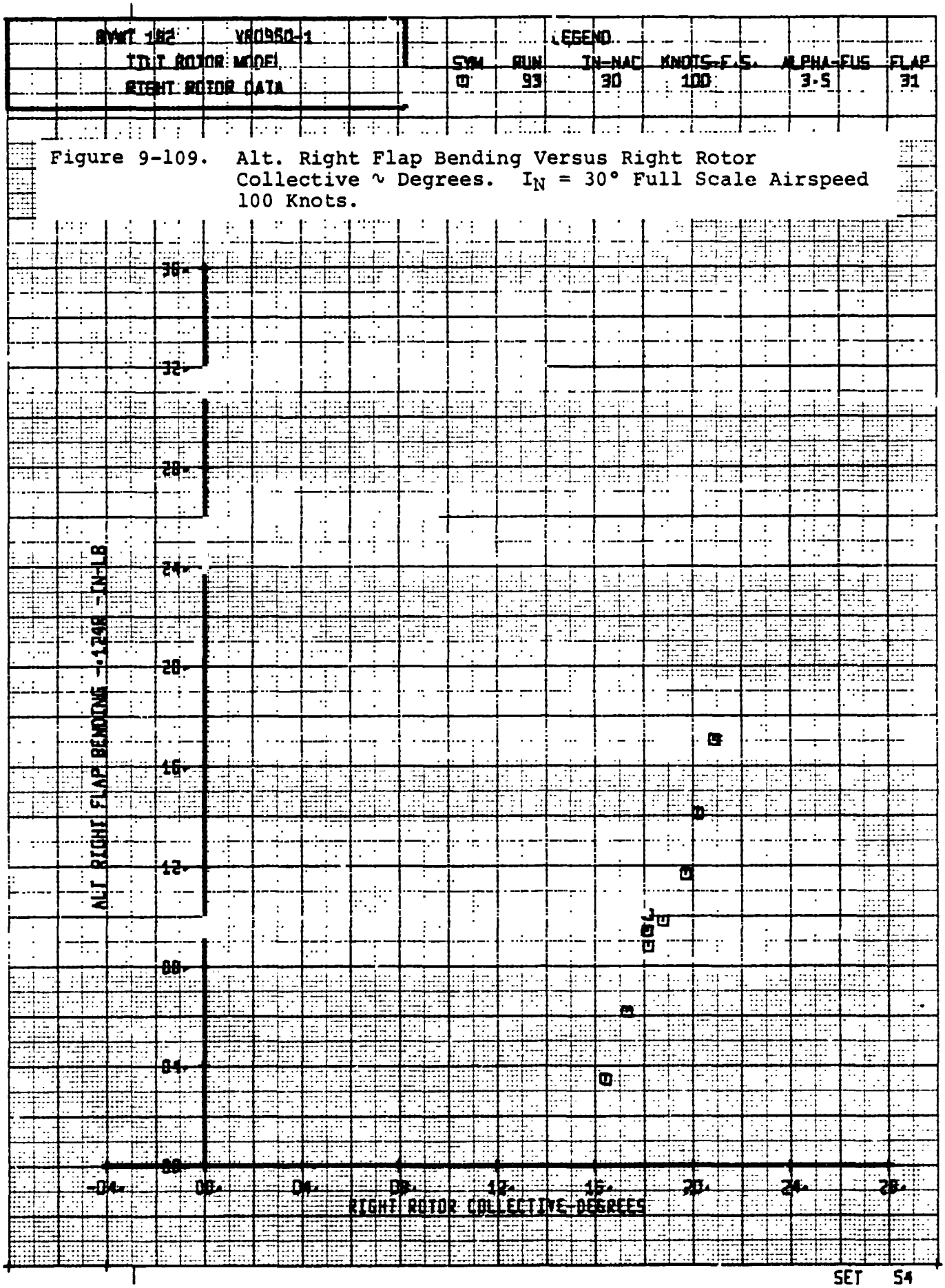

Figure 9-109. Alt. Right Flap Bending Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

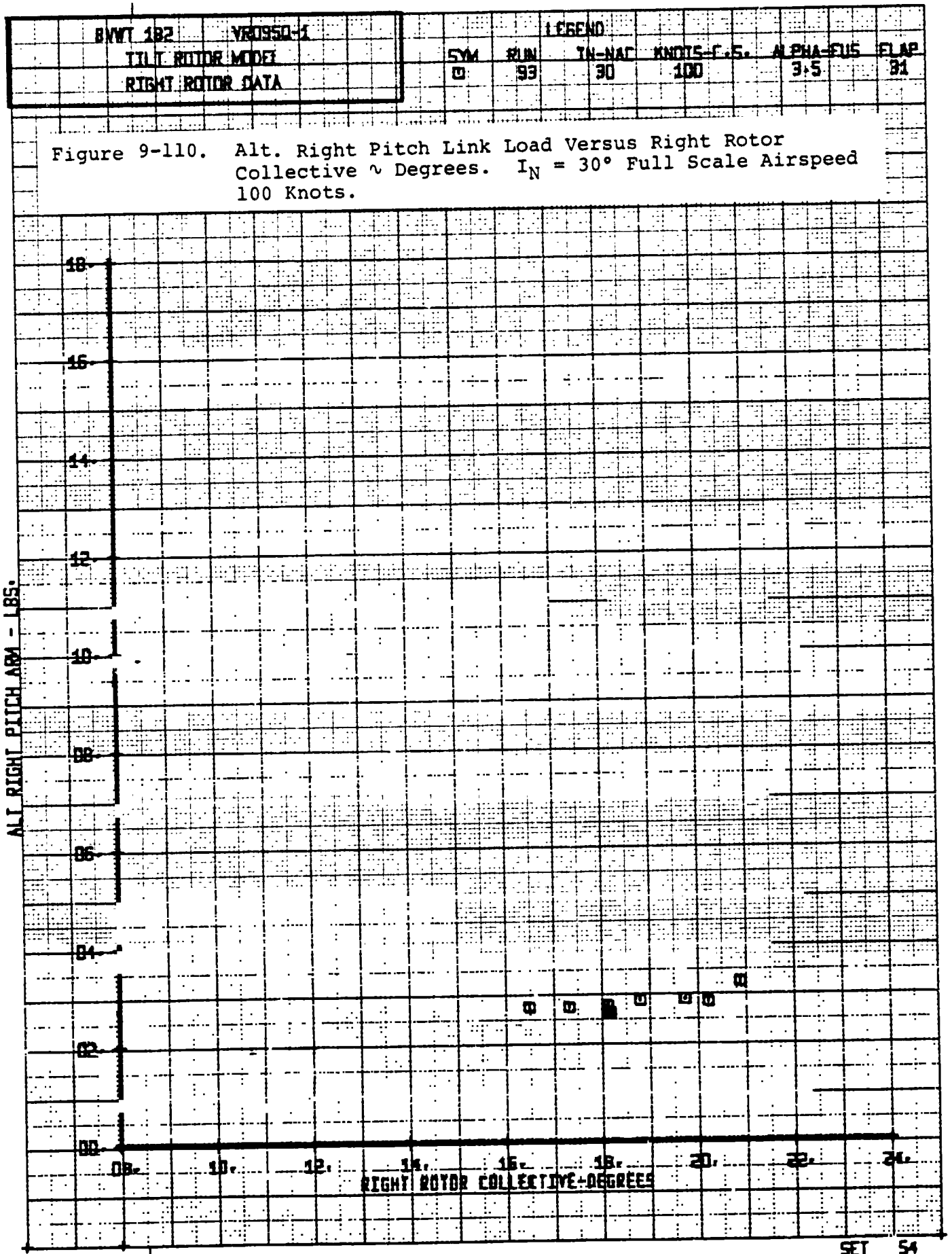

Figure 9-110. Alt. Right Pitch Link Load Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

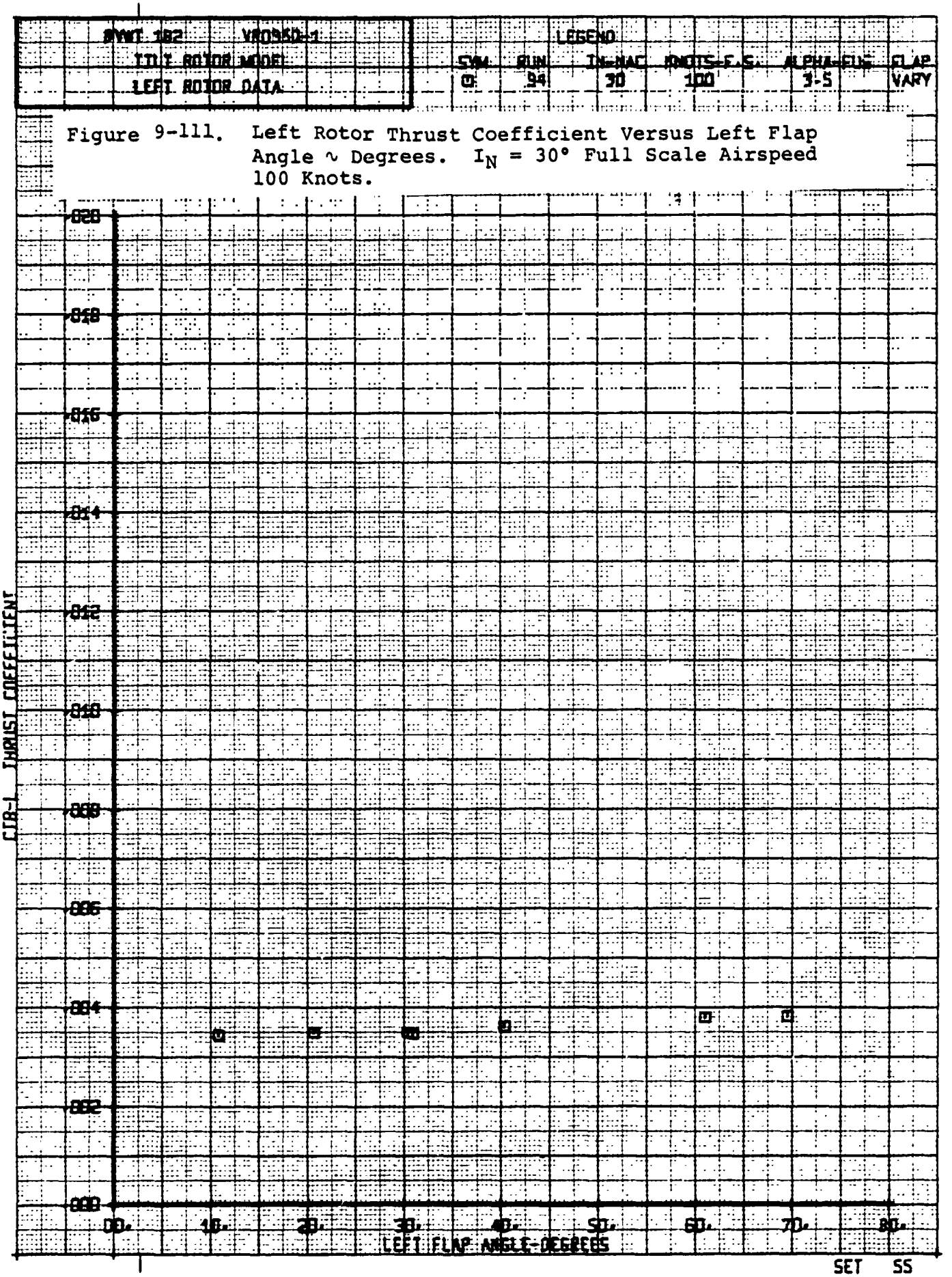

Figure 9-111. Left Rotor Thrust Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

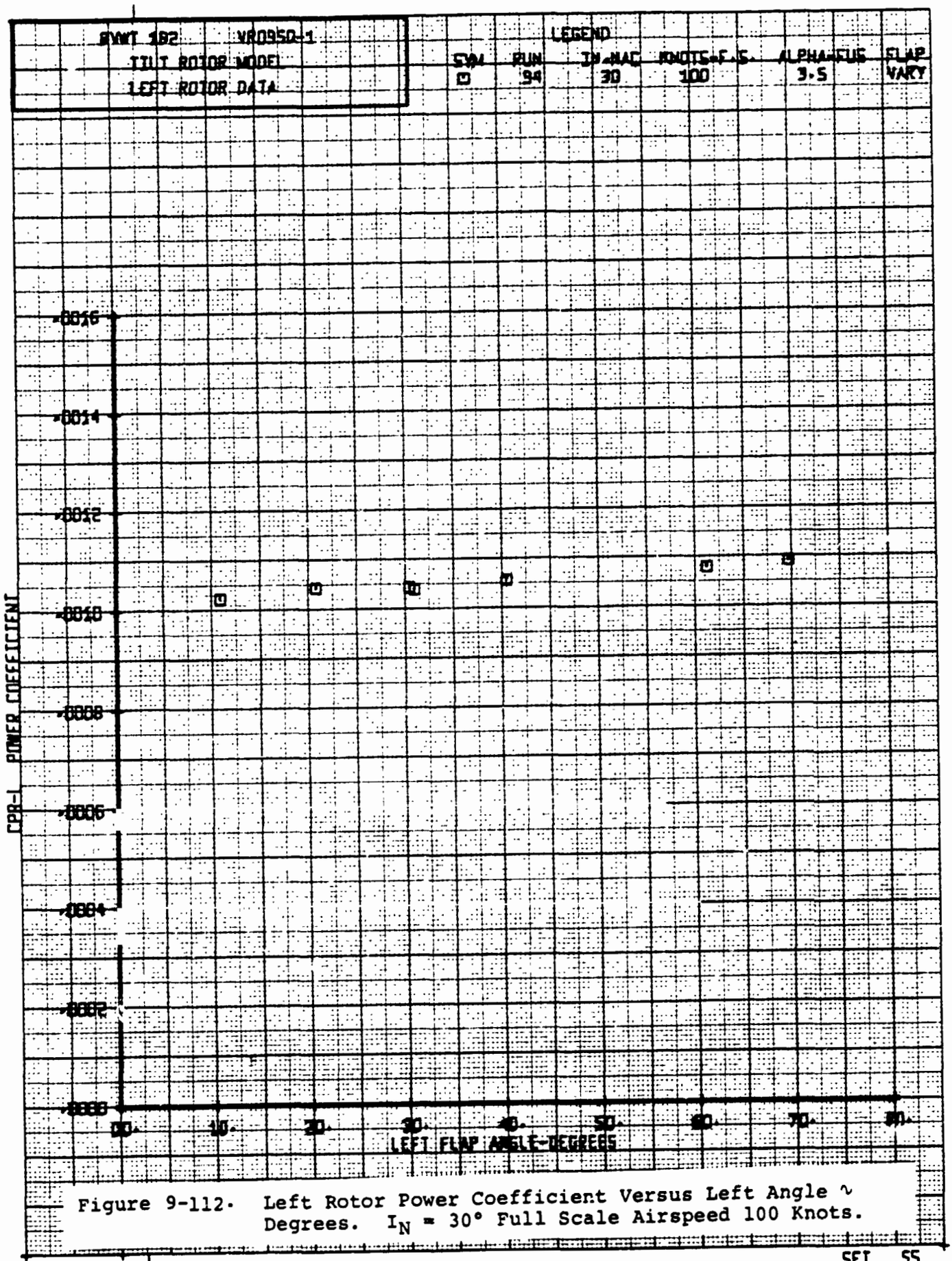

Figure 9-112. Left Rotor Power Coefficient Versus Left Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

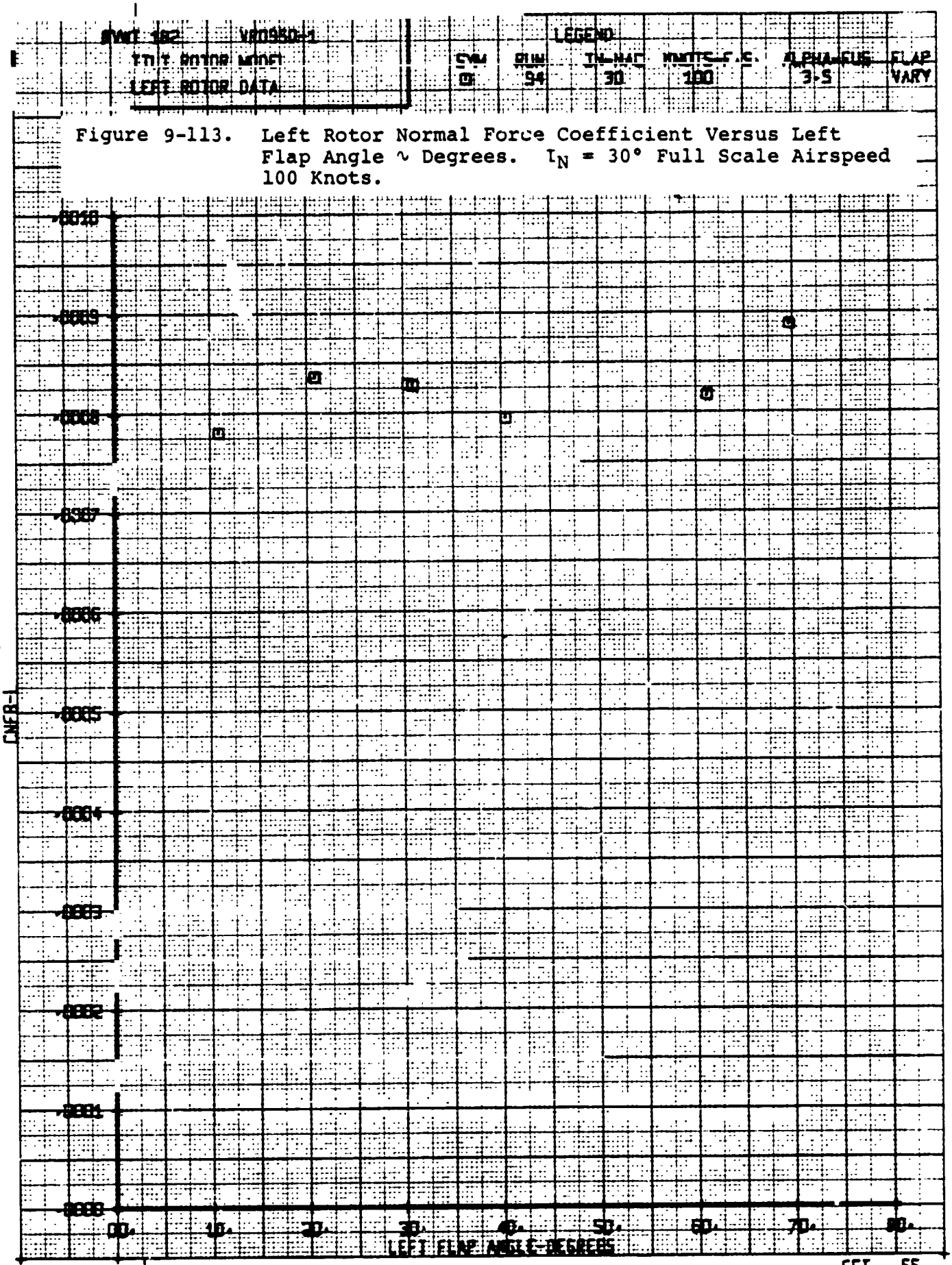

Figure 9-113. Left Rotor Normal Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

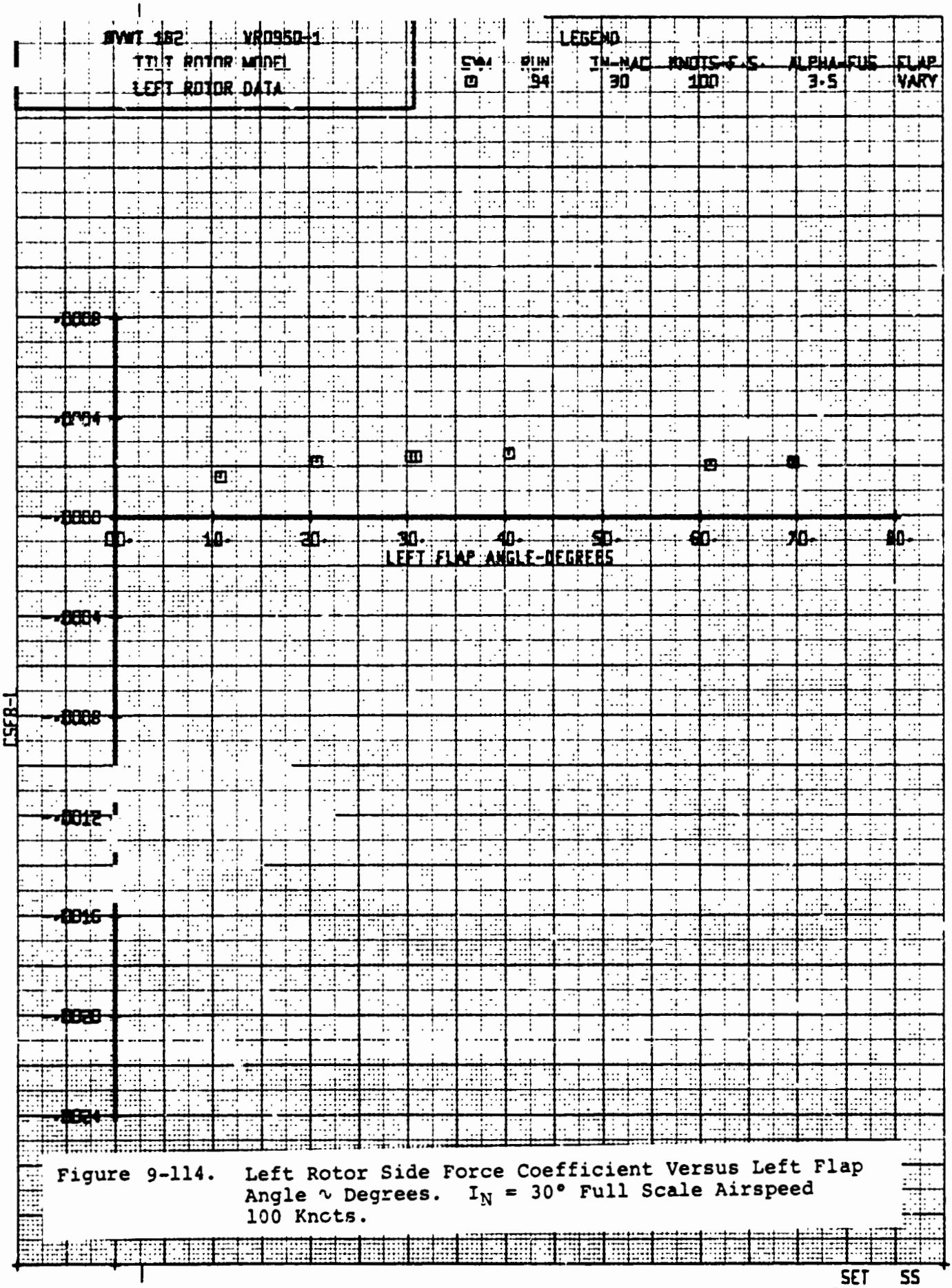

Figure 9-114. Left Rotor Side Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

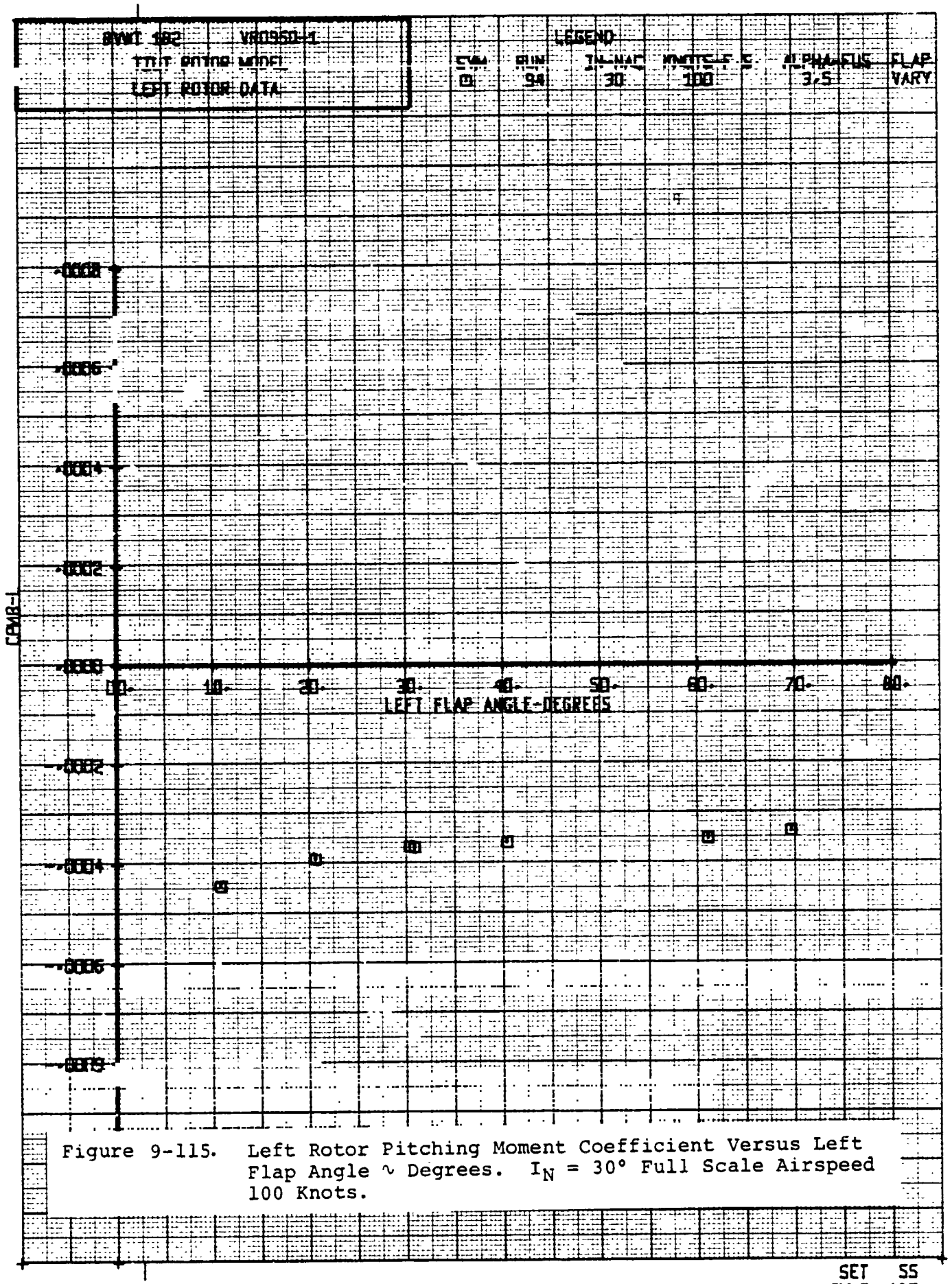

Figure 9-115. Left Rotor Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

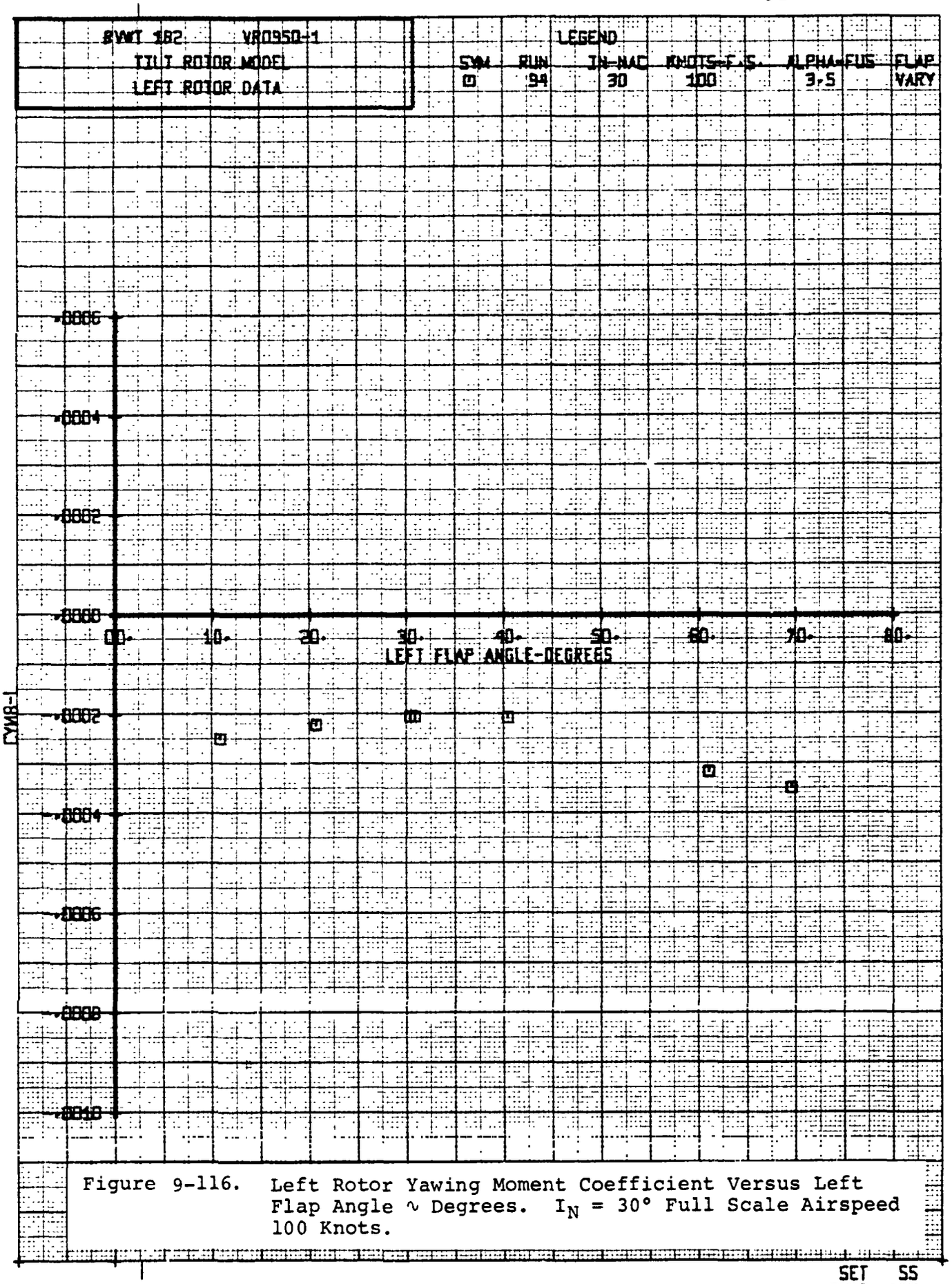

Figure 9-116. Left Rotor Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

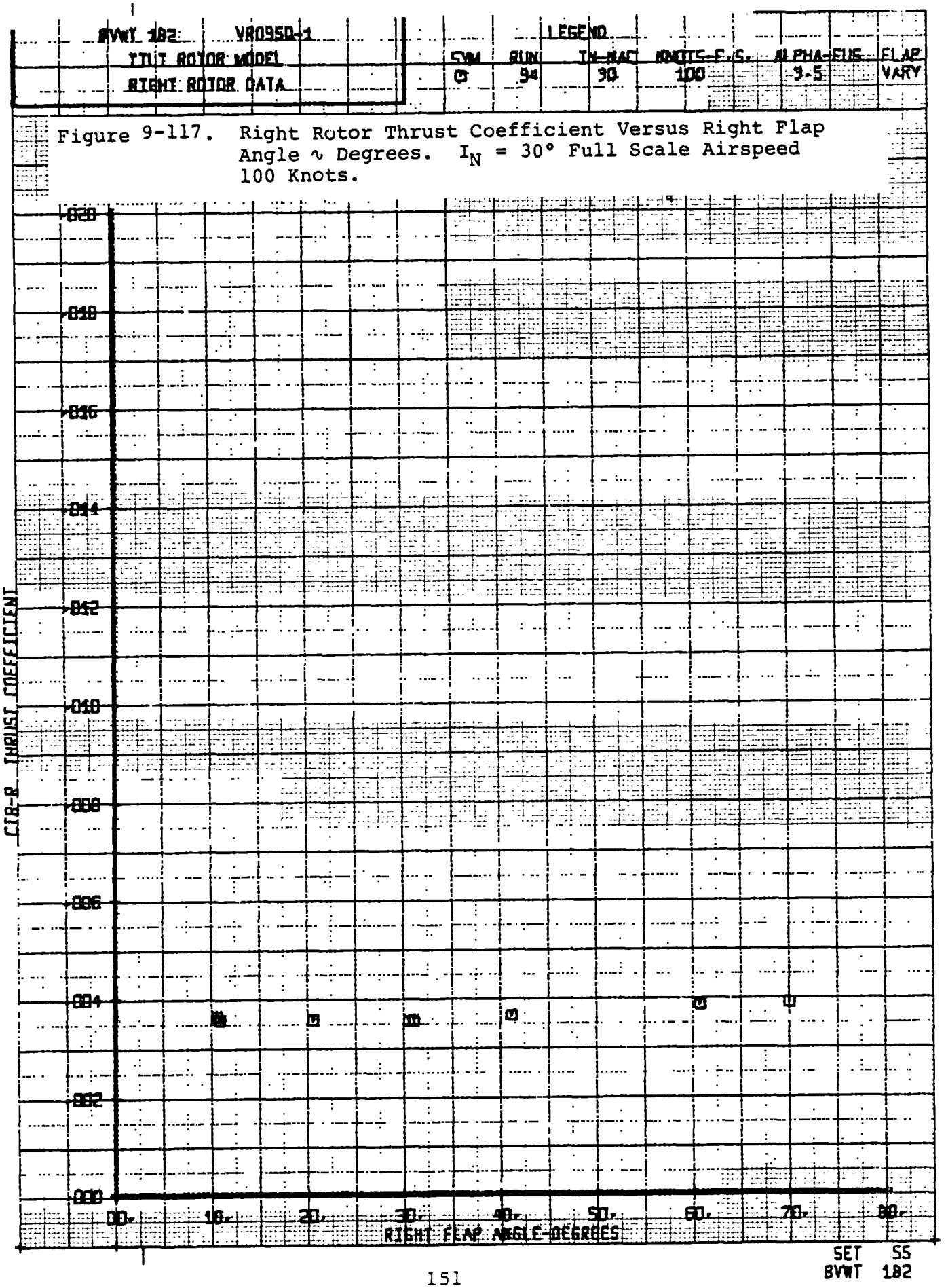

Figure 9-117. Right Rotor Thrust Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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SET SS
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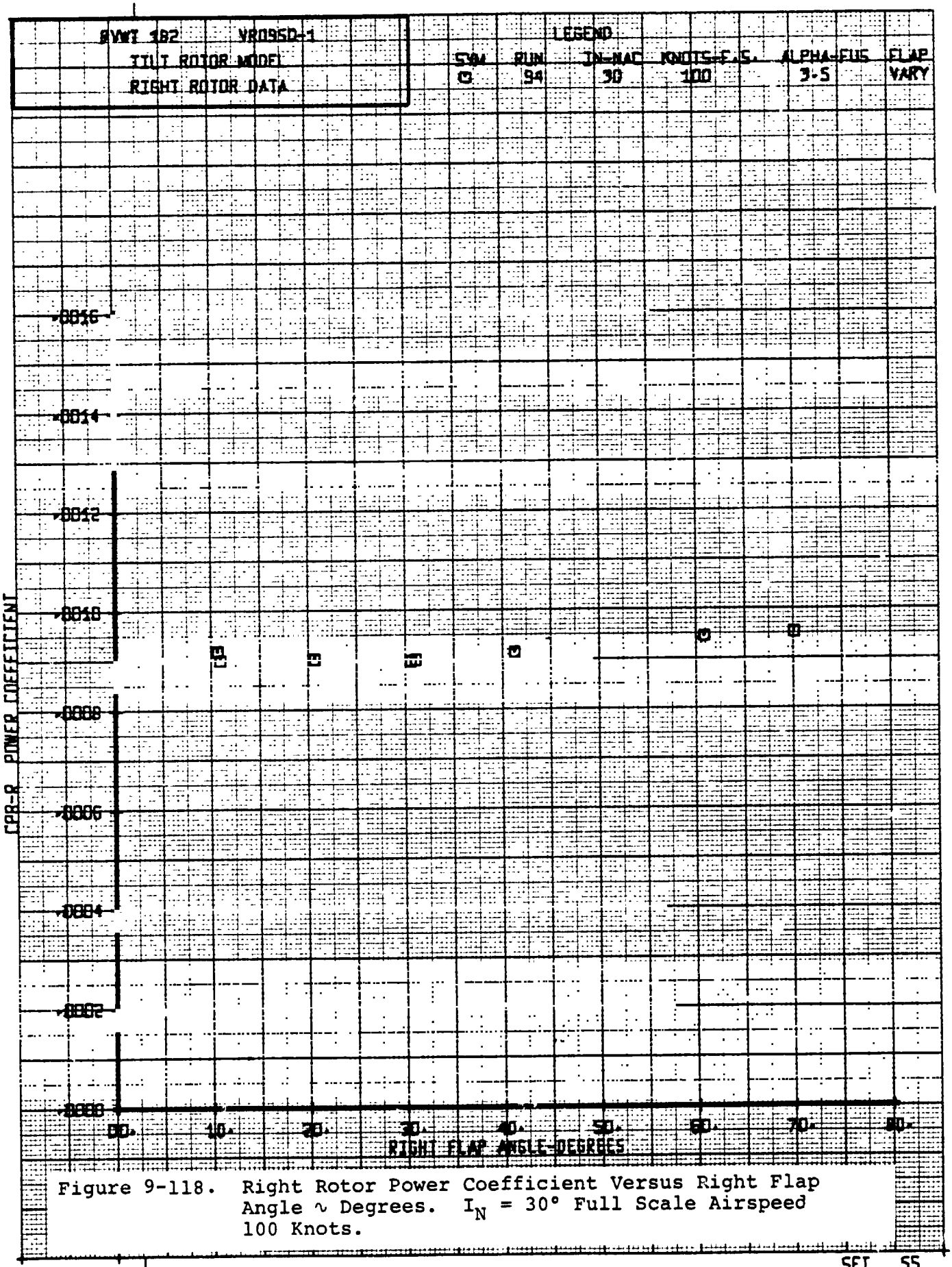

Figure 9-118. Right Rotor Power Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

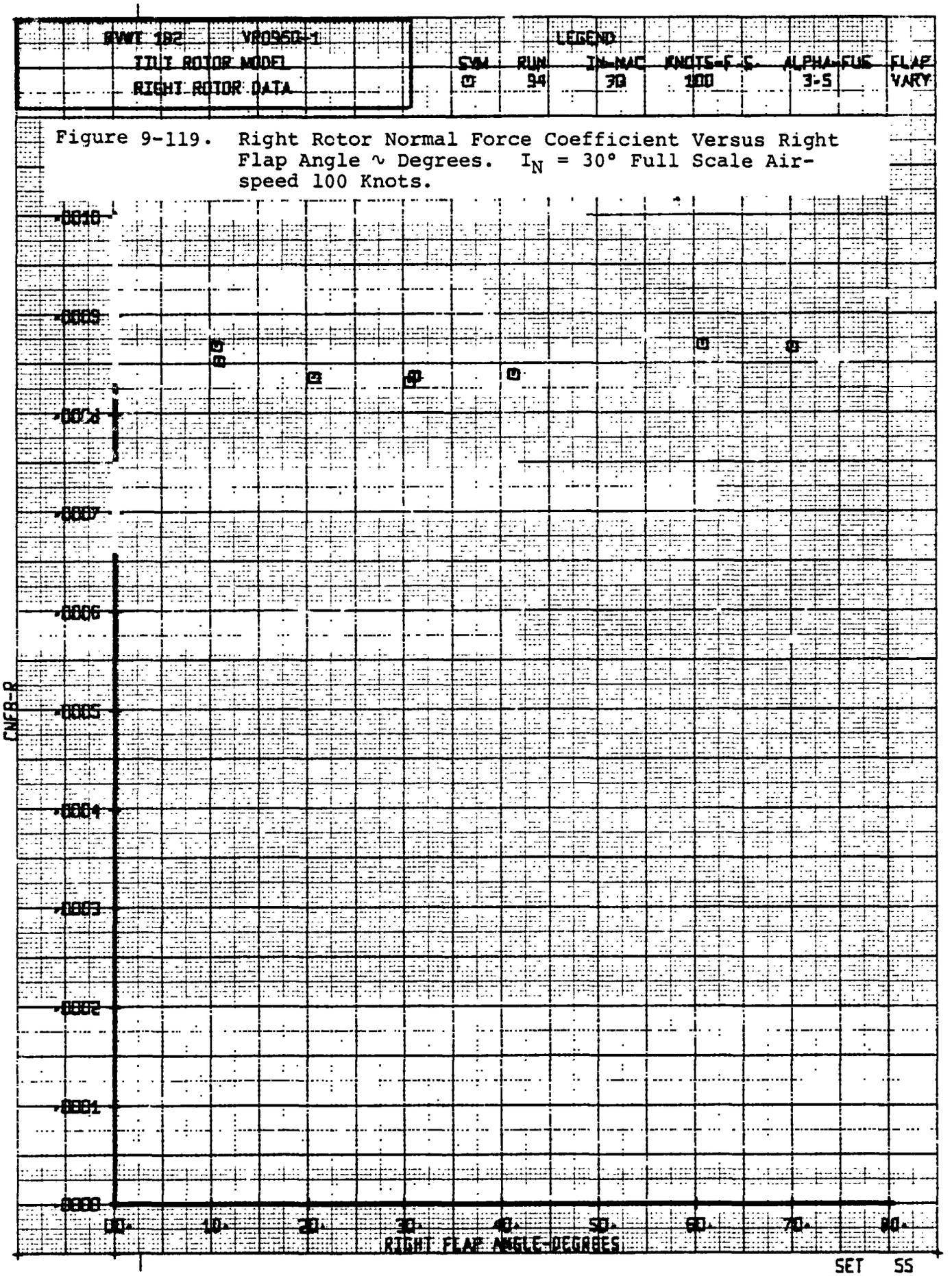

Figure 9-119. Right Rotor Normal Force Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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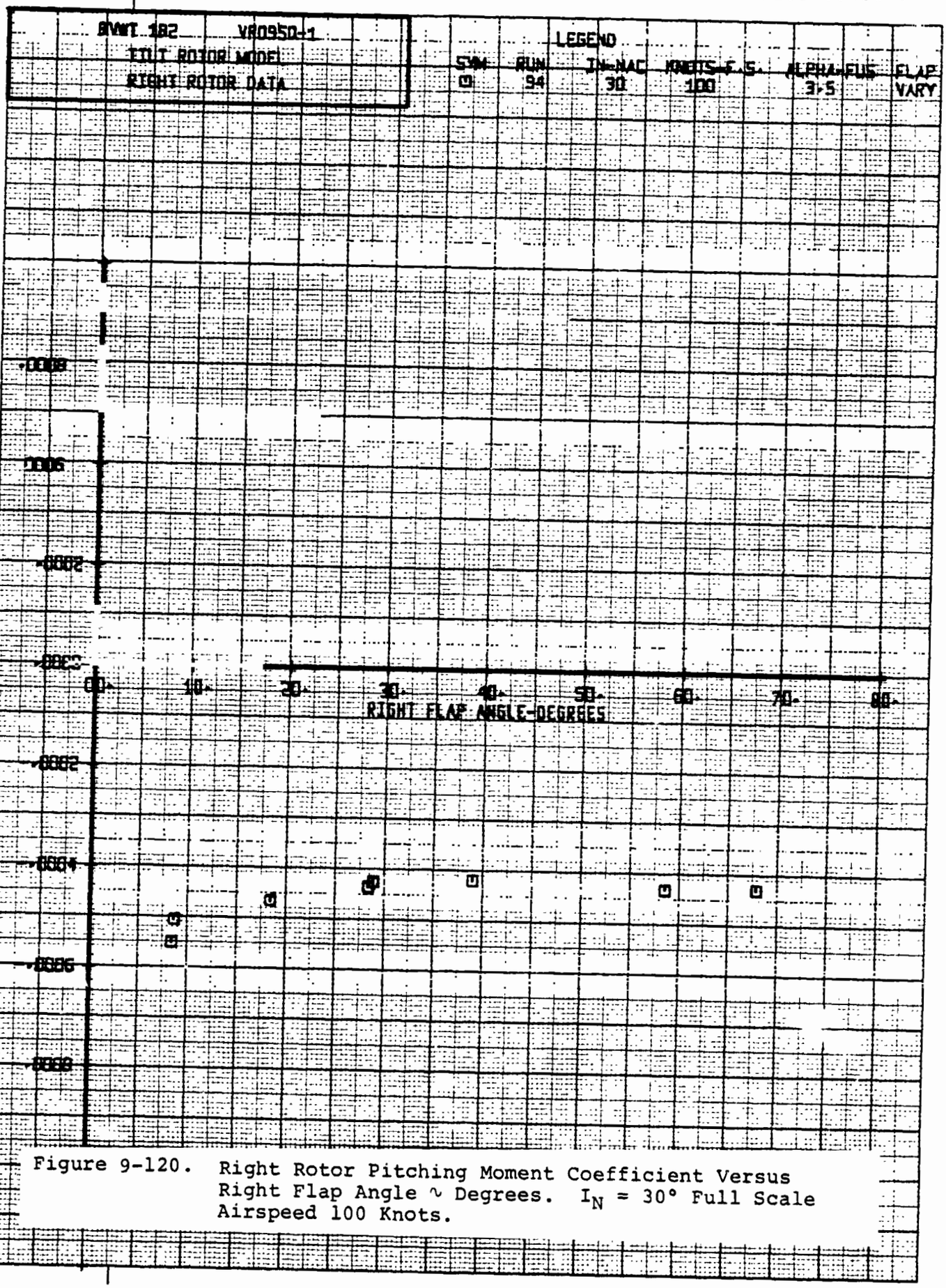

Figure 9-120. Right Rotor Pitching Moment Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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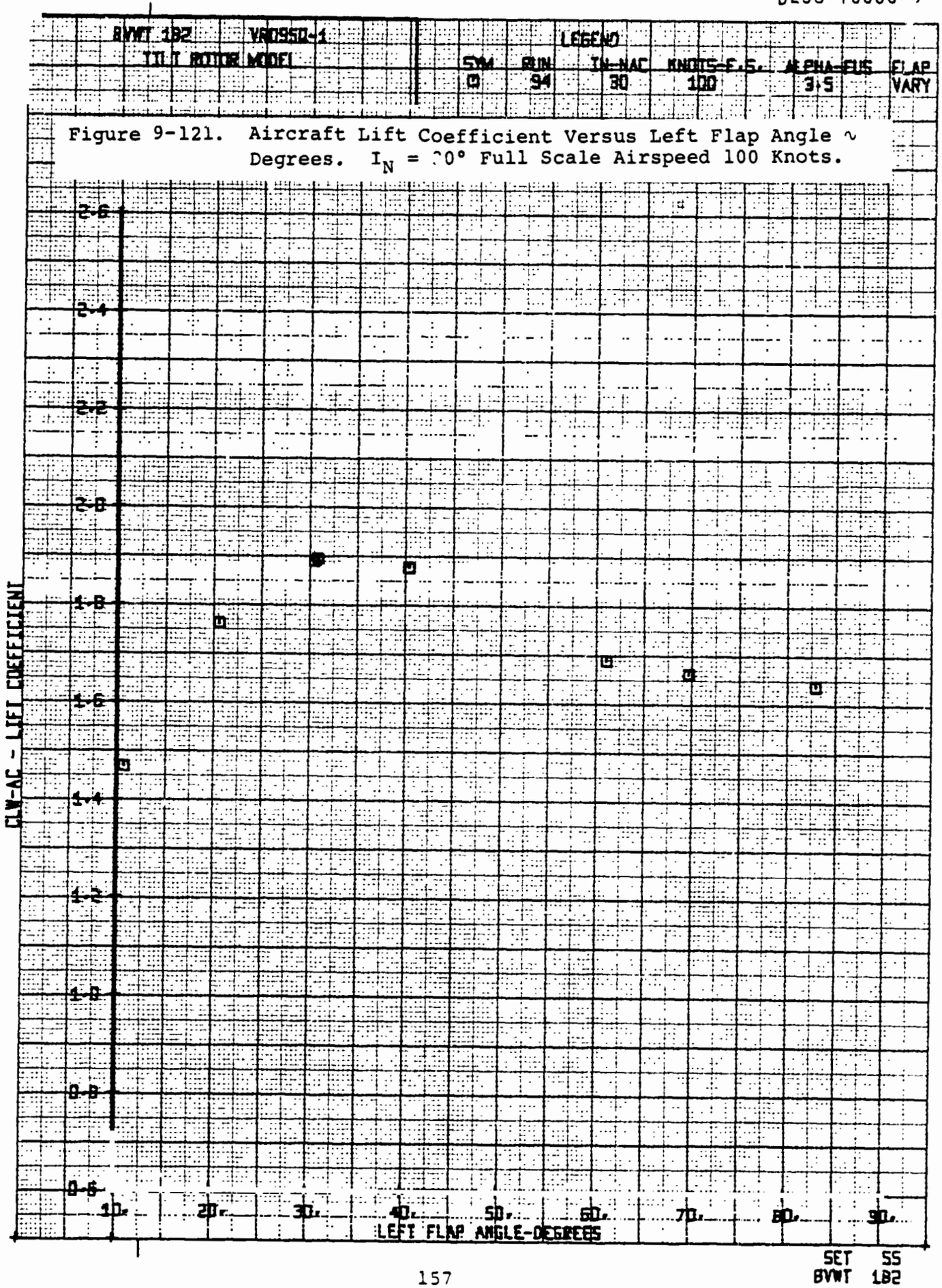

Figure 9-121. Aircraft Lift Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

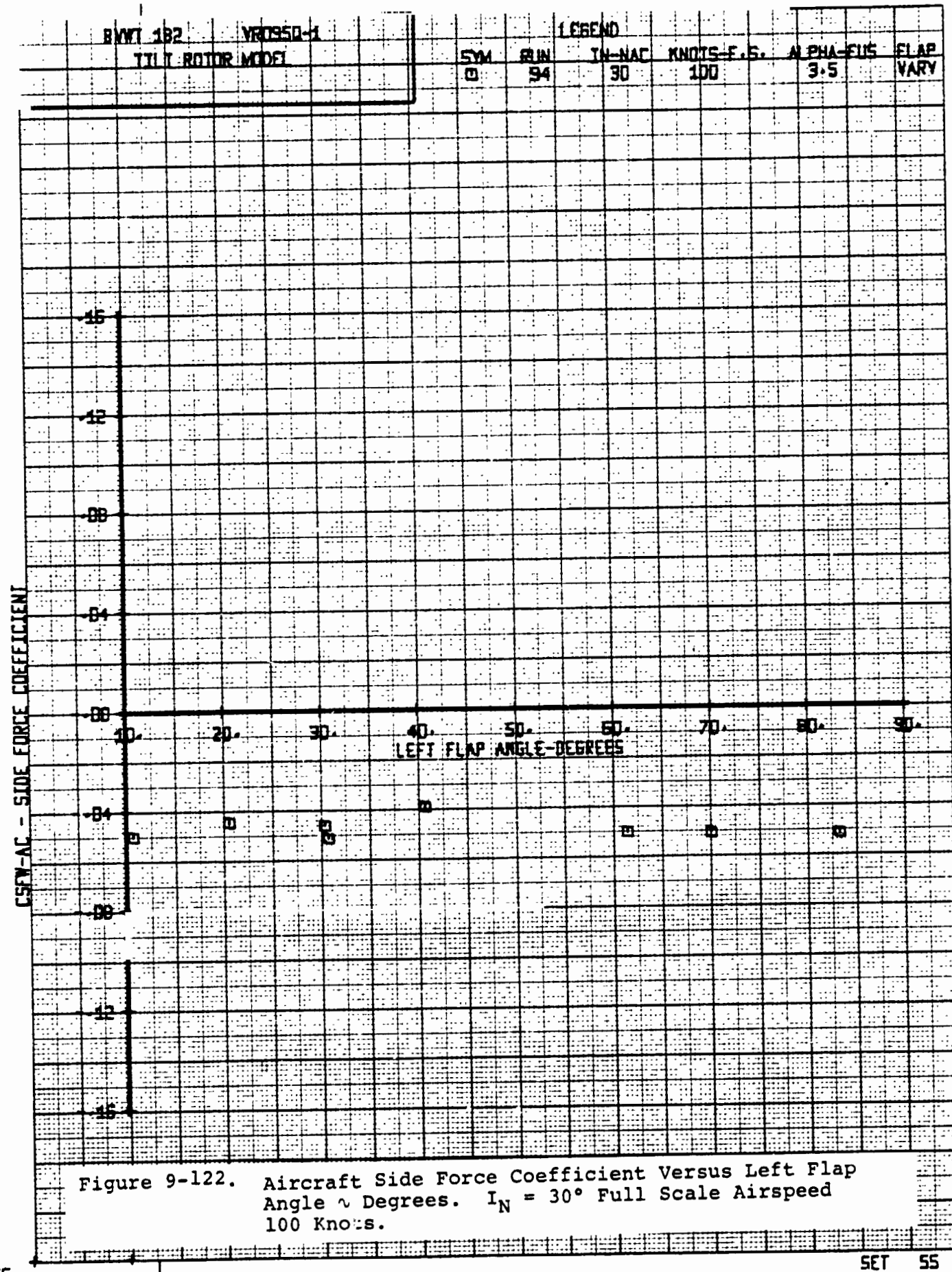

Figure 9-122. Aircraft Side Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

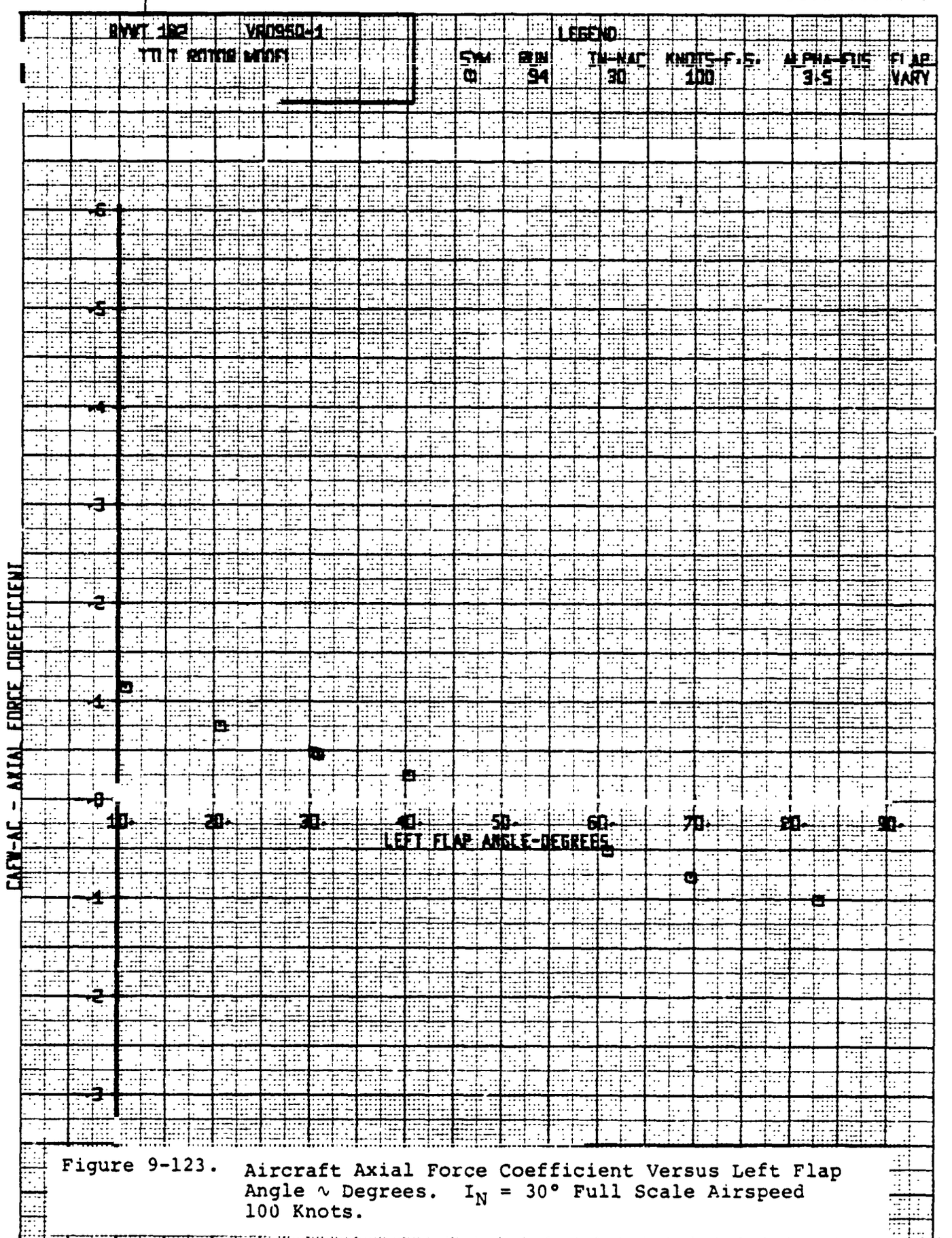

Figure 9-123. Aircraft Axial Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

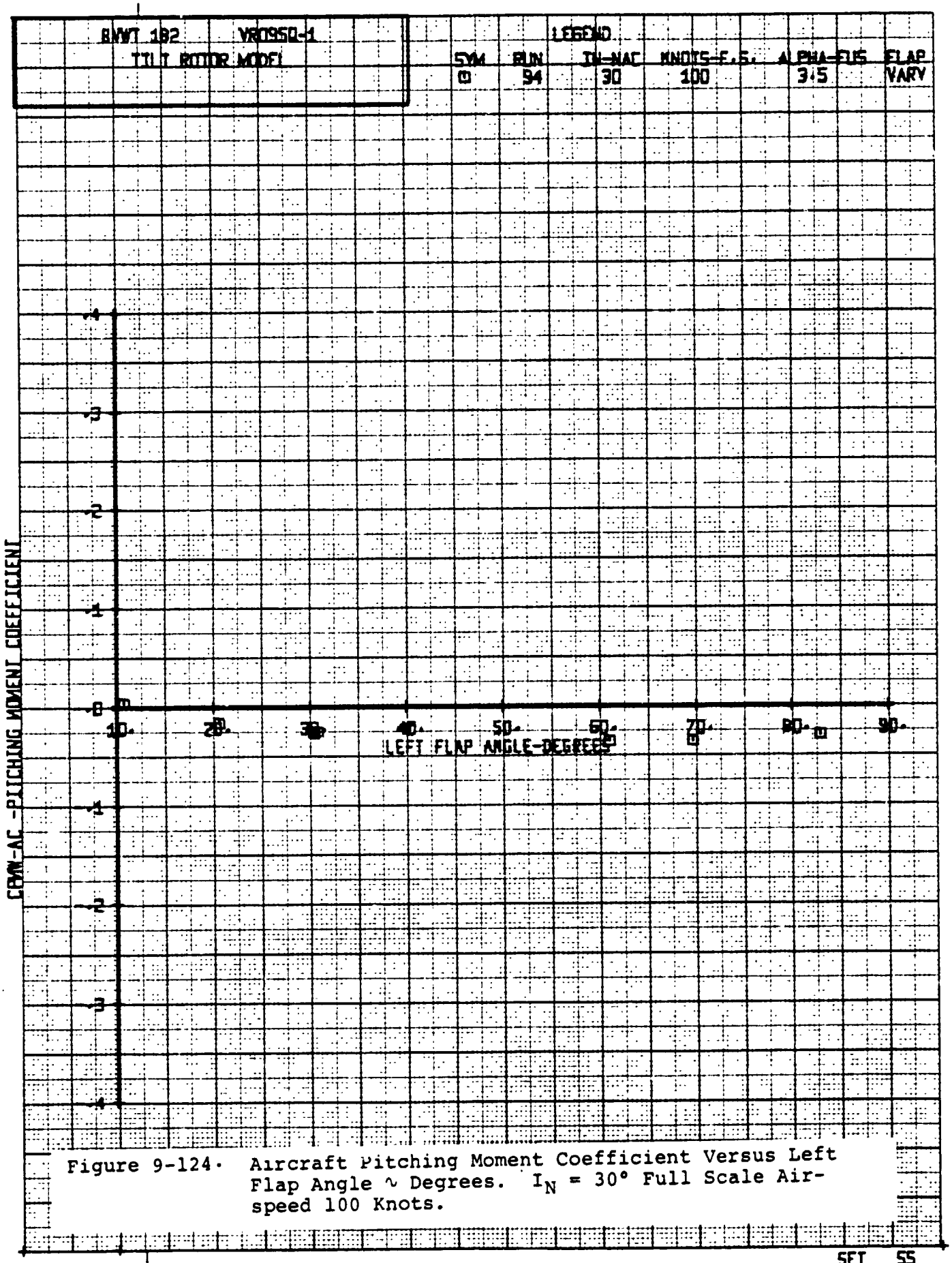

Figure 9-124. Aircraft Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

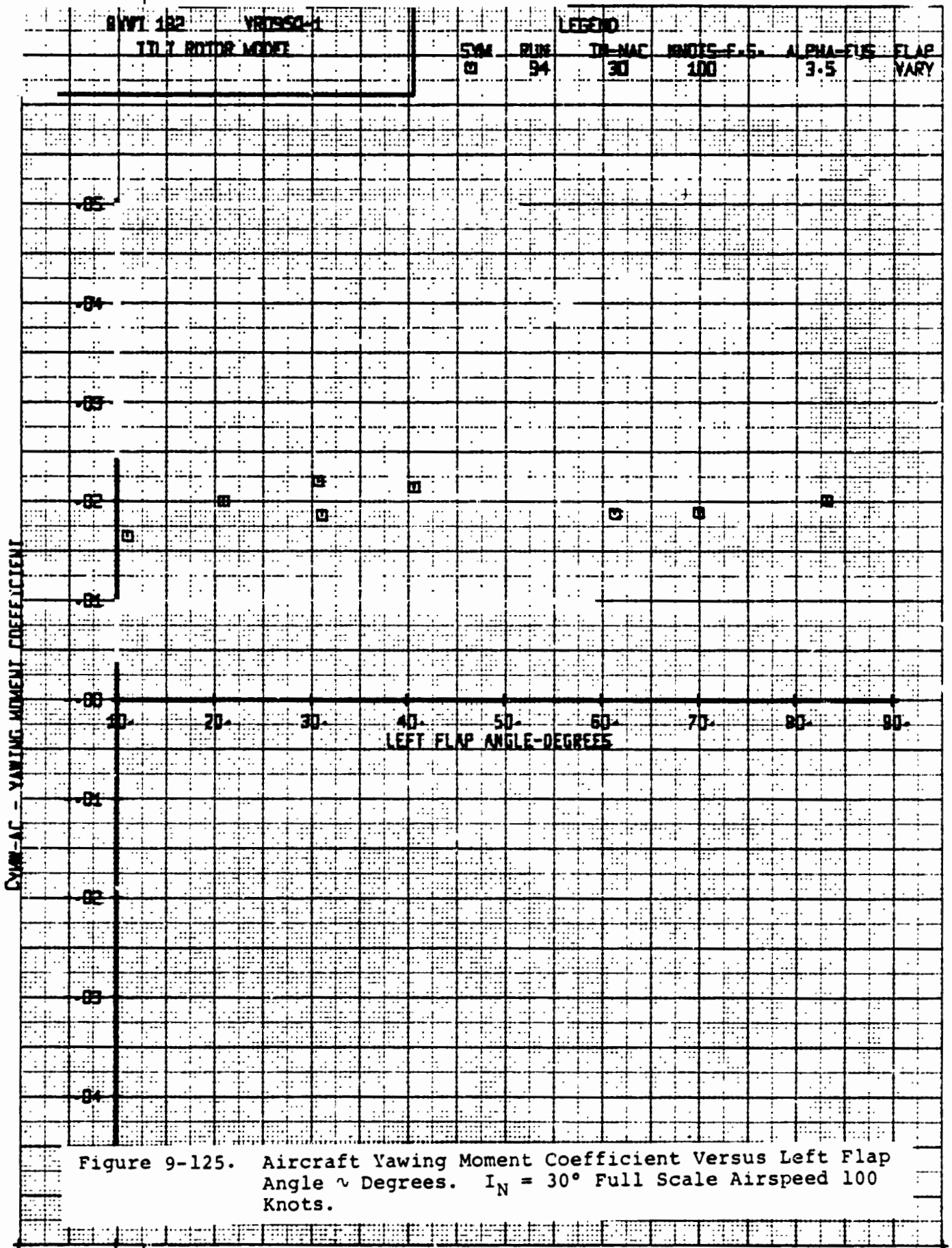

Figure 9-125. Aircraft Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

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W 182

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BVWT 182

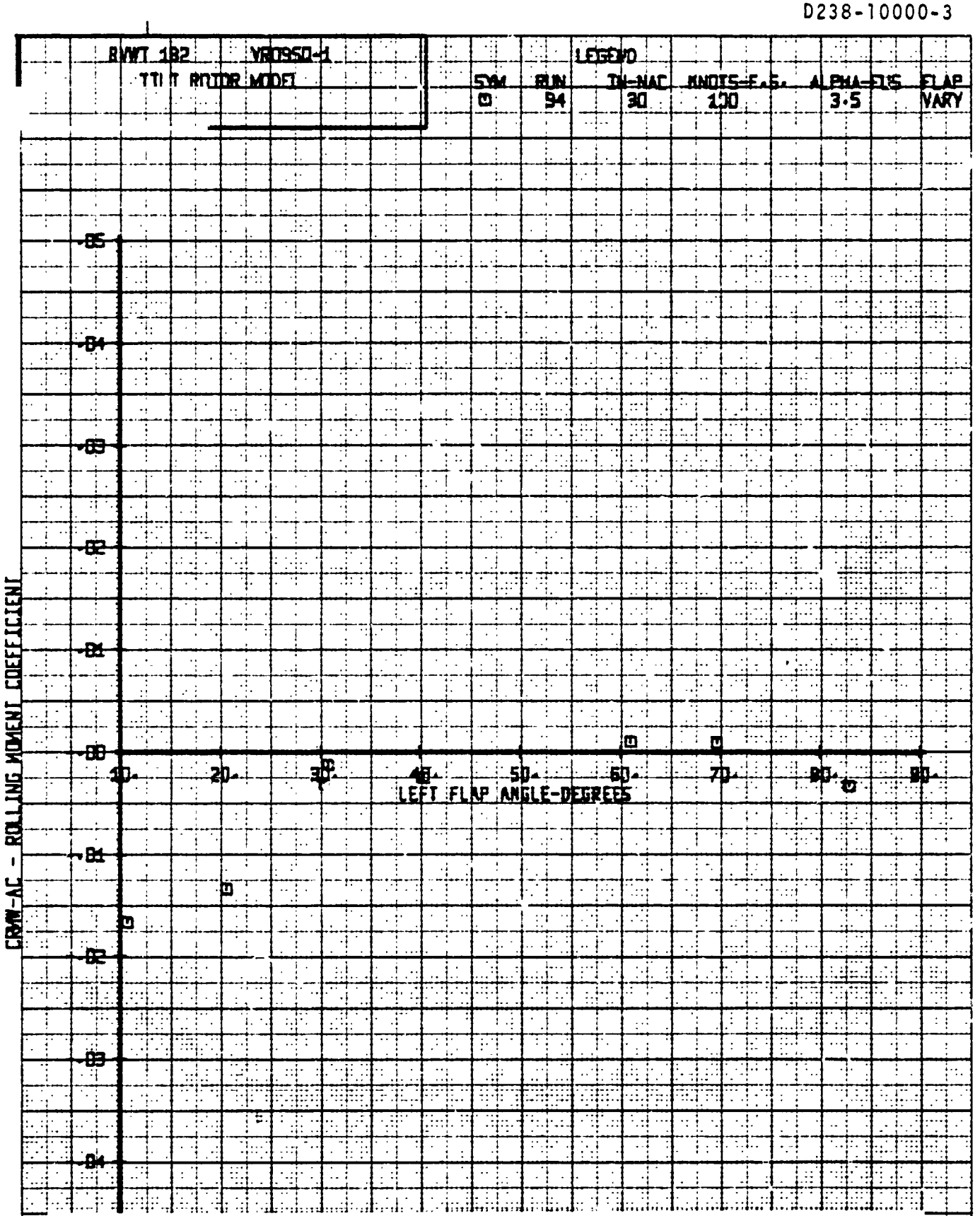

Figure 9-126. Aircraft Rolling Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

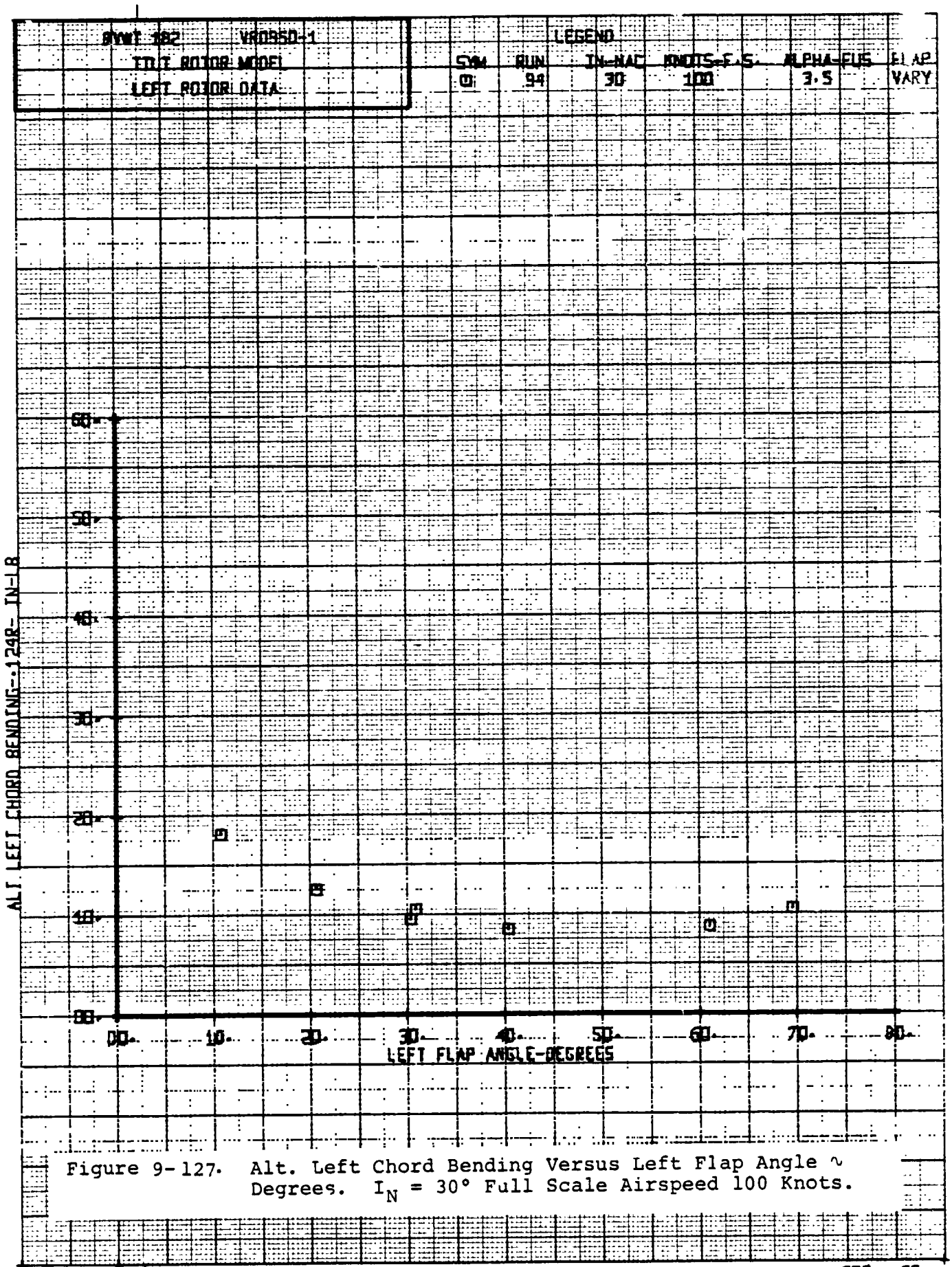

Figure 9-127. Alt. Left Chord Bending Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

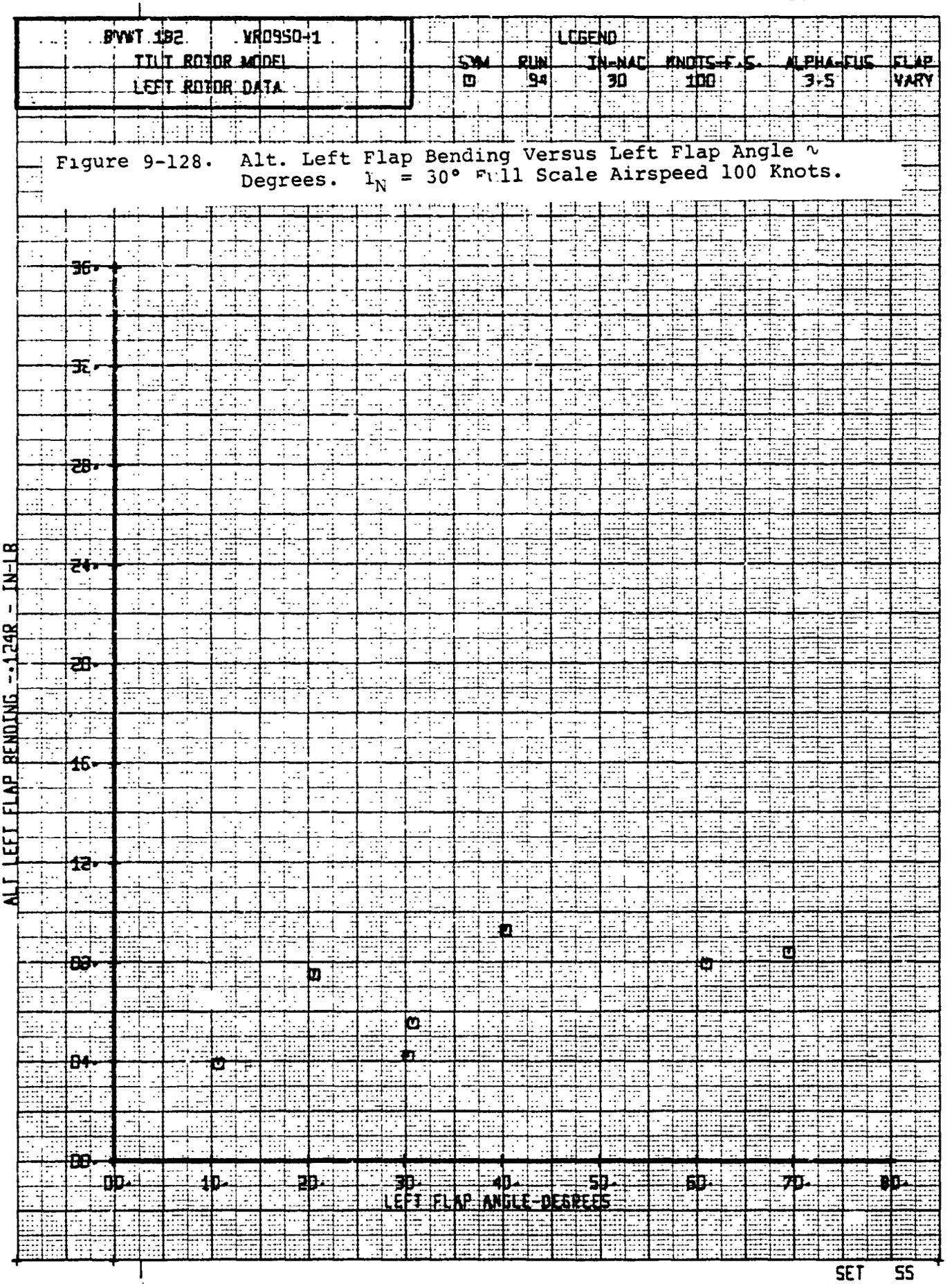

Figure 9-128. Alt. Left Flap Bending Versus Left Flap Angle ∿ Degrees. i_N = 30° Full Scale Airspeed 100 Knots.

SS 182

SET SS BVWT 182

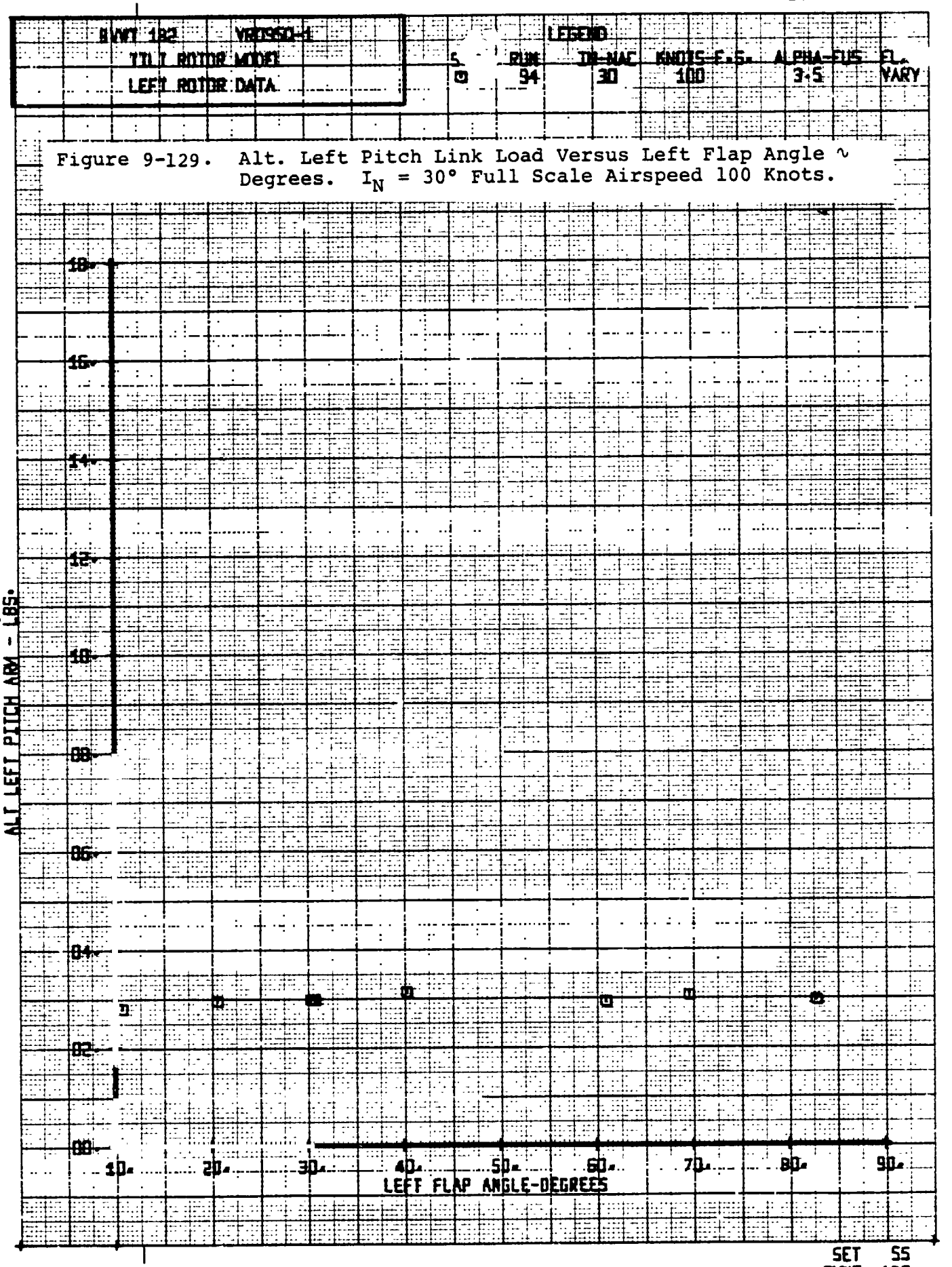

Figure 9-129. Alt. Left Pitch Link Load Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

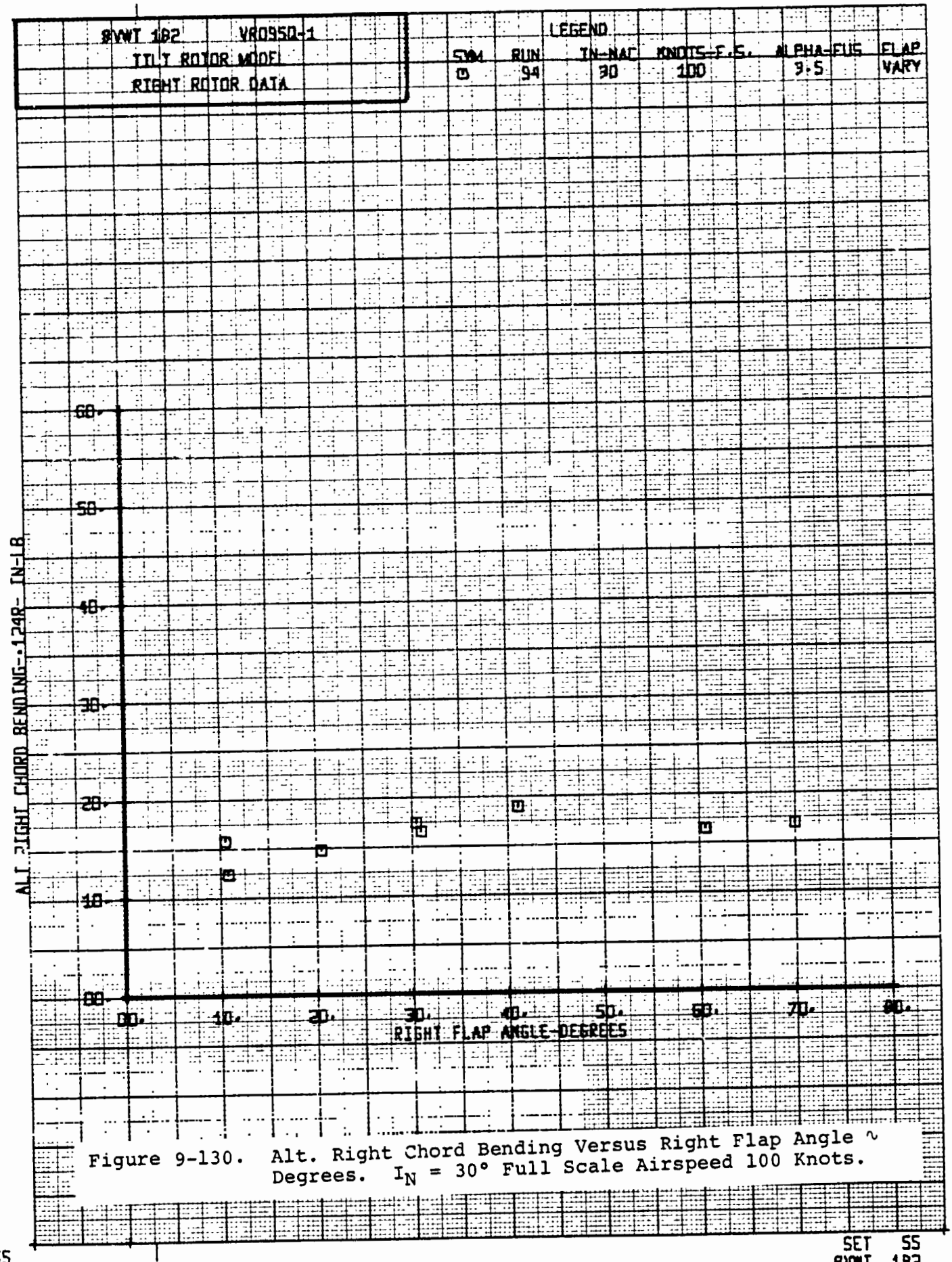

Figure 9-130. Alt. Right Chord Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

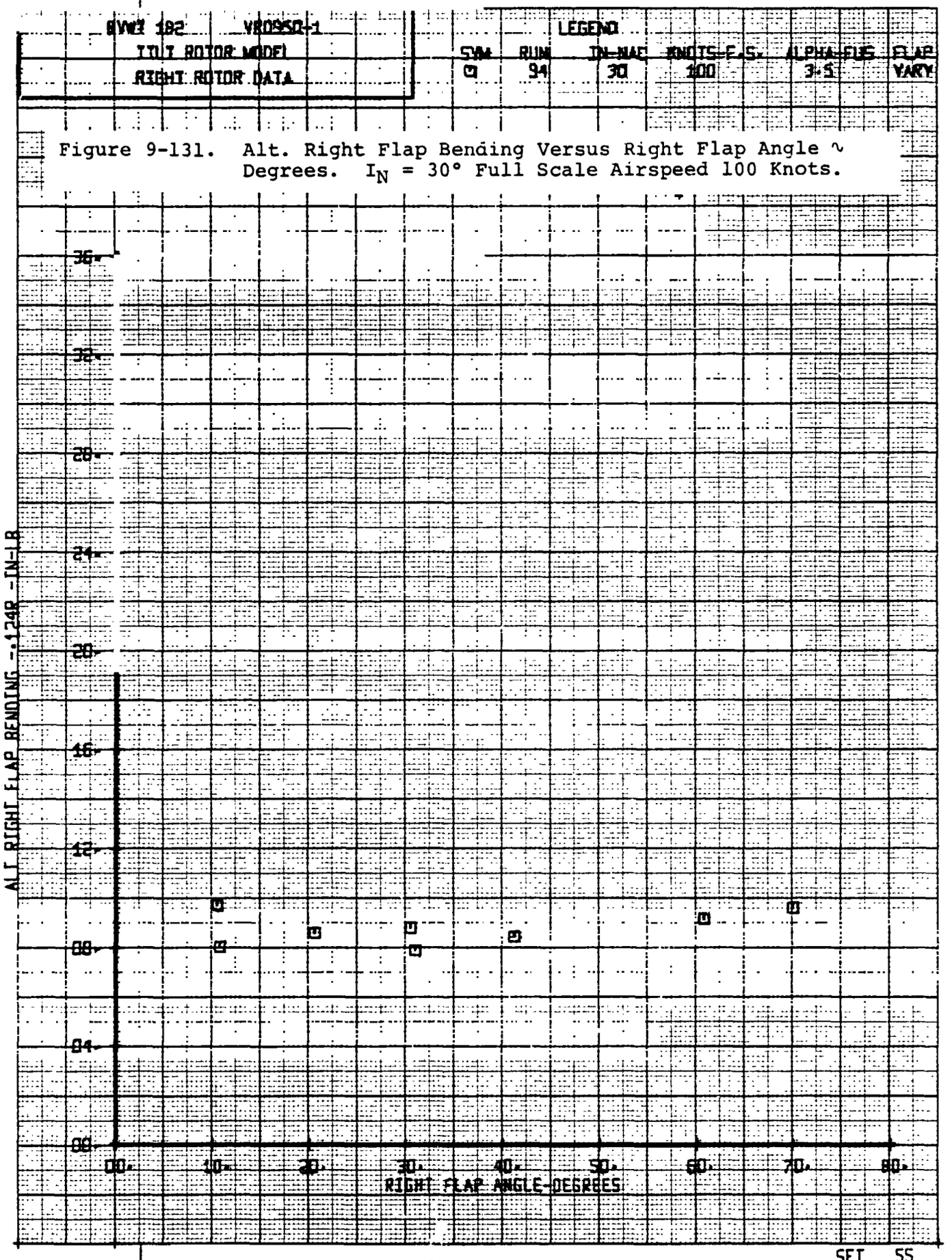

Figure 9-131. Alt. Right Flap Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

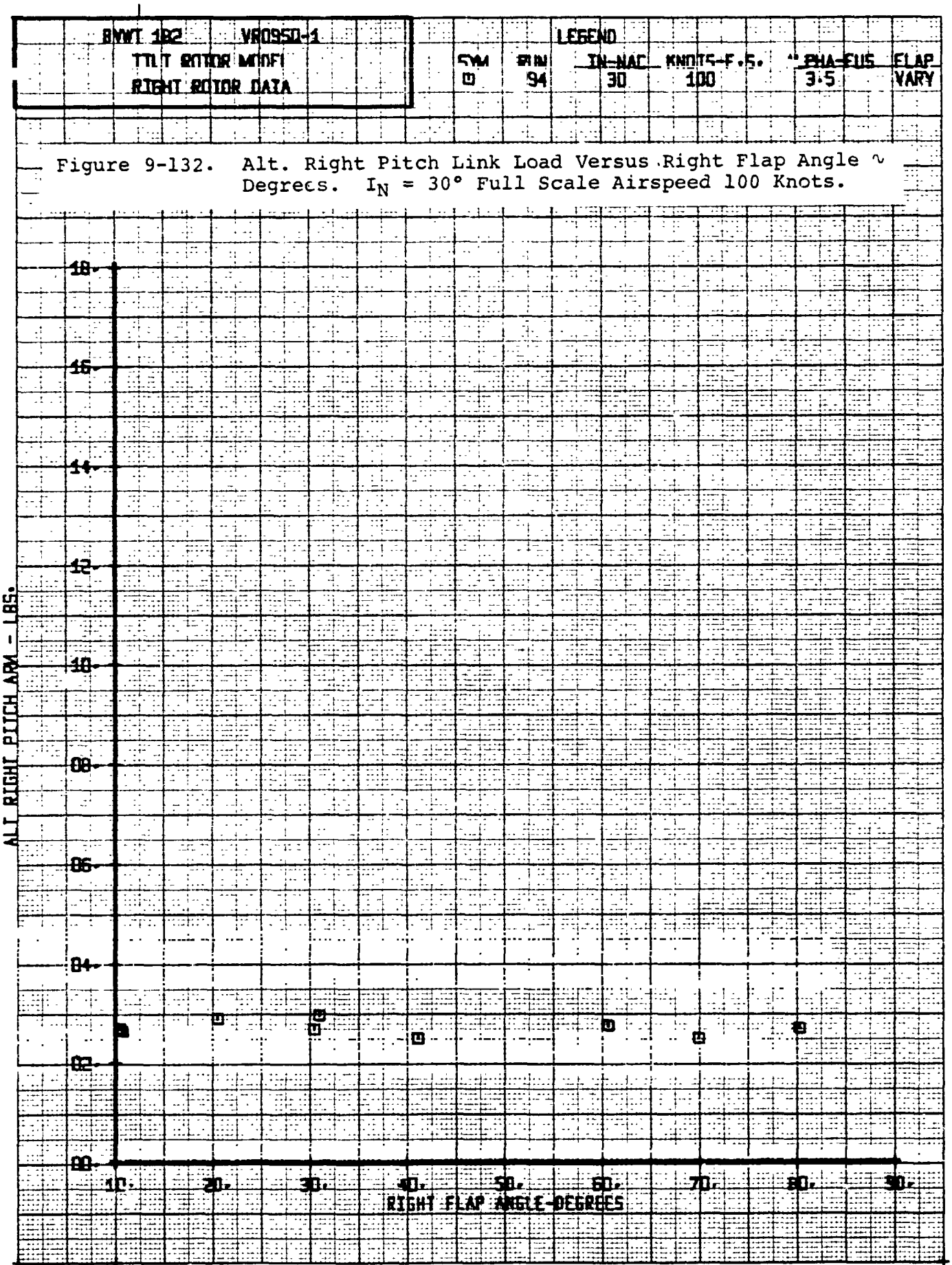

Figure 9-132. Alt. Right Pitch Link Load Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 100 Knots.

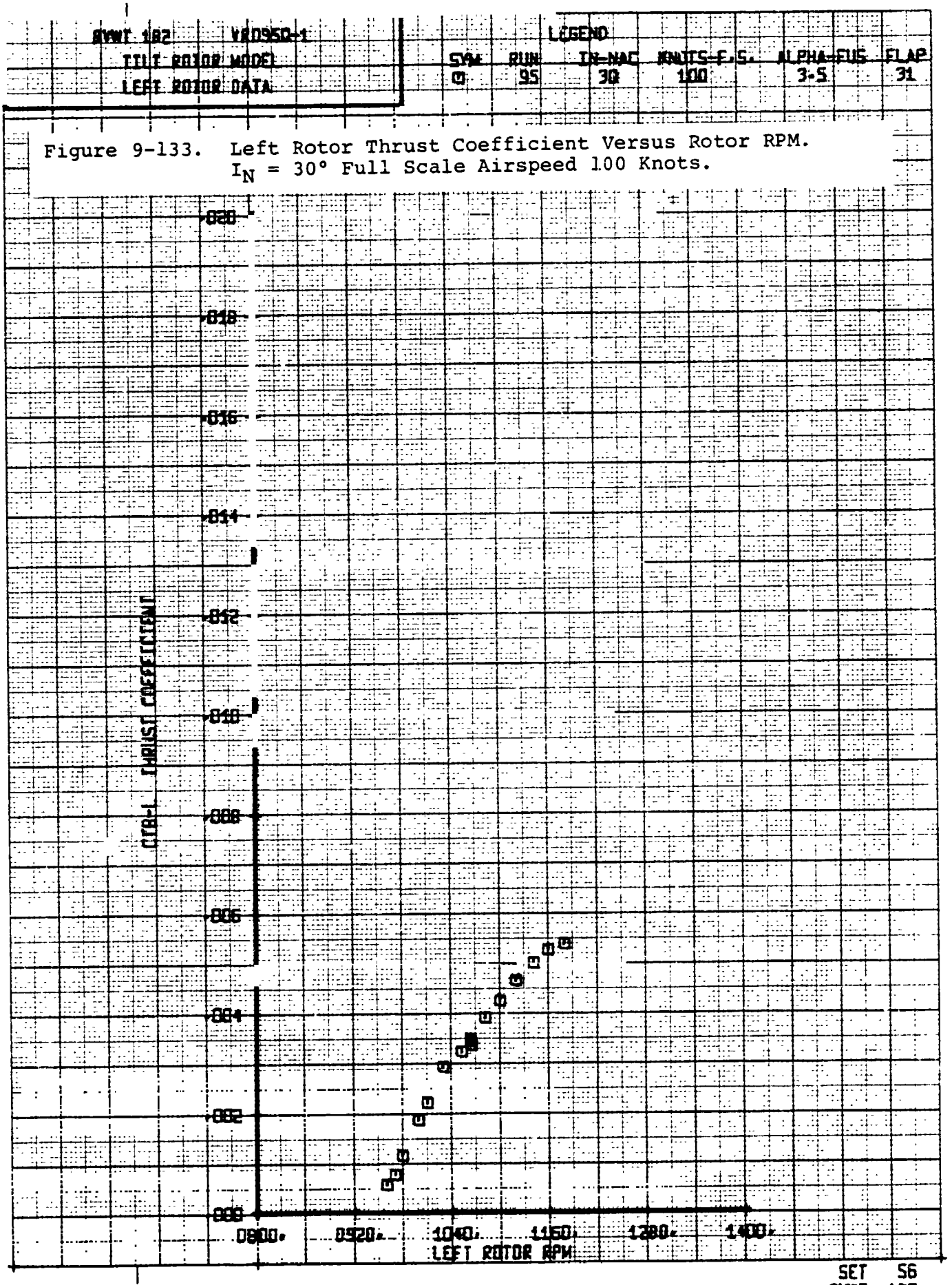

Figure 9-133. Left Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

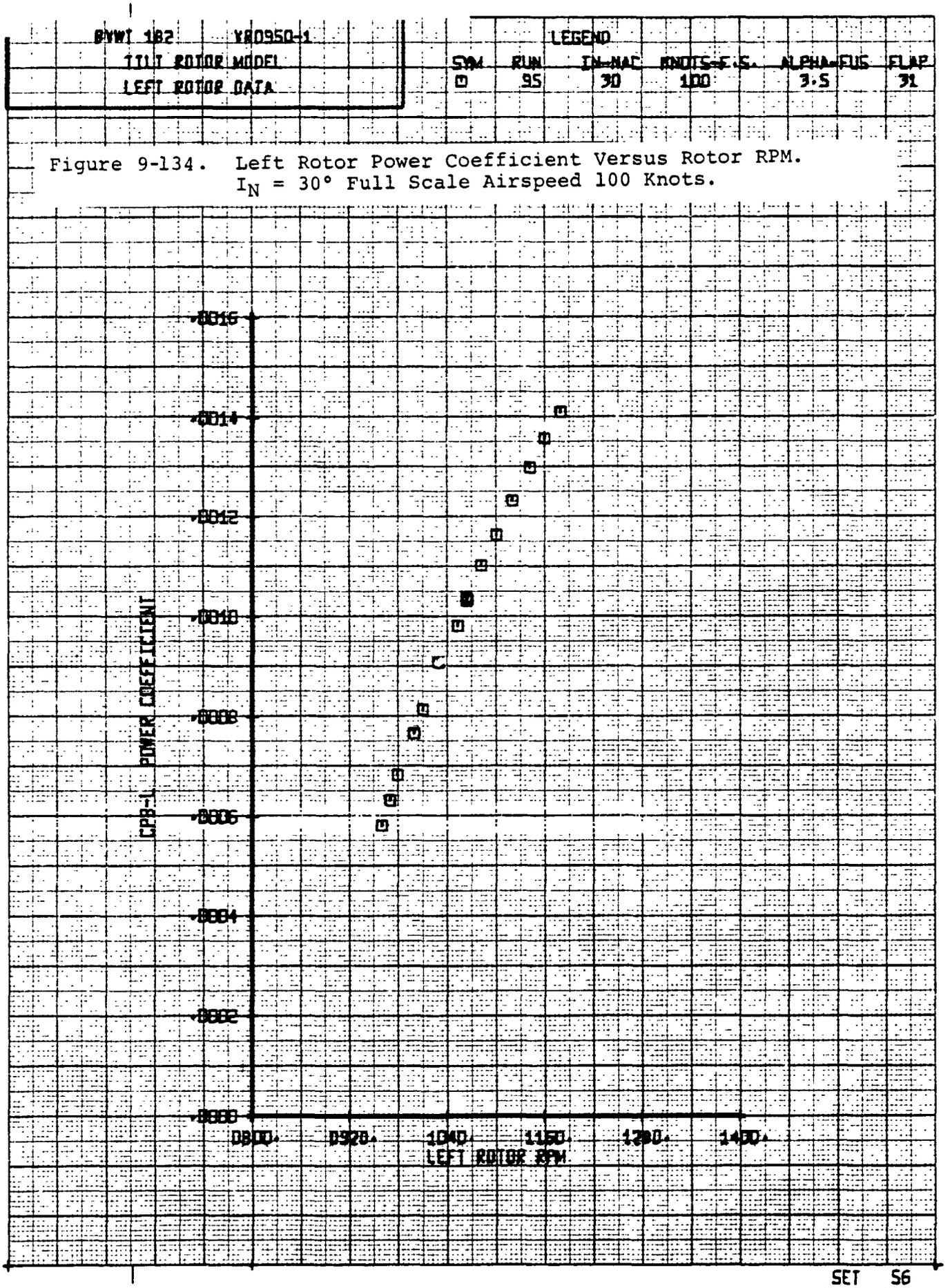

Figure 9-134. Left Rotor Power Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

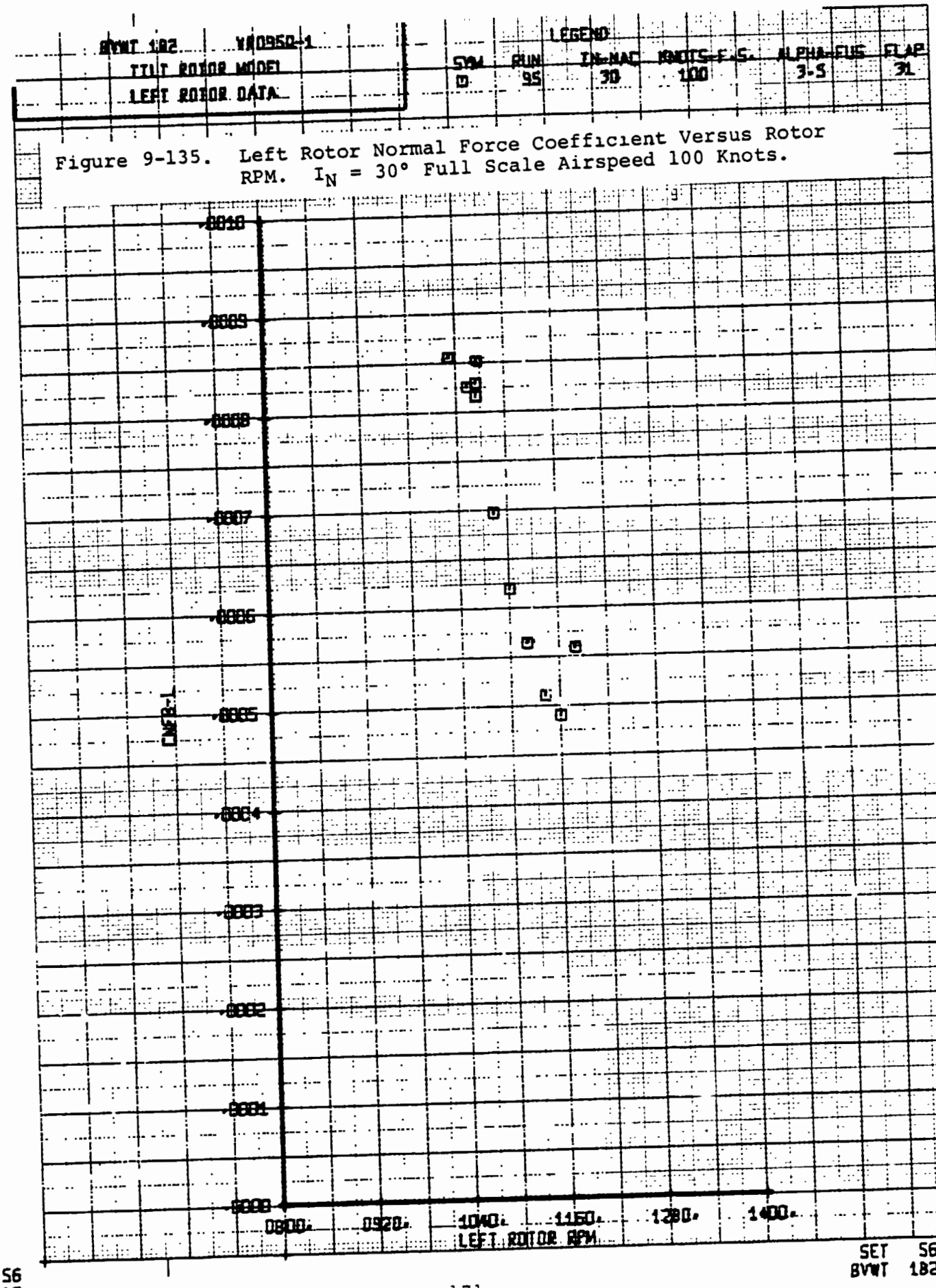

Figure 9-135. Left Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

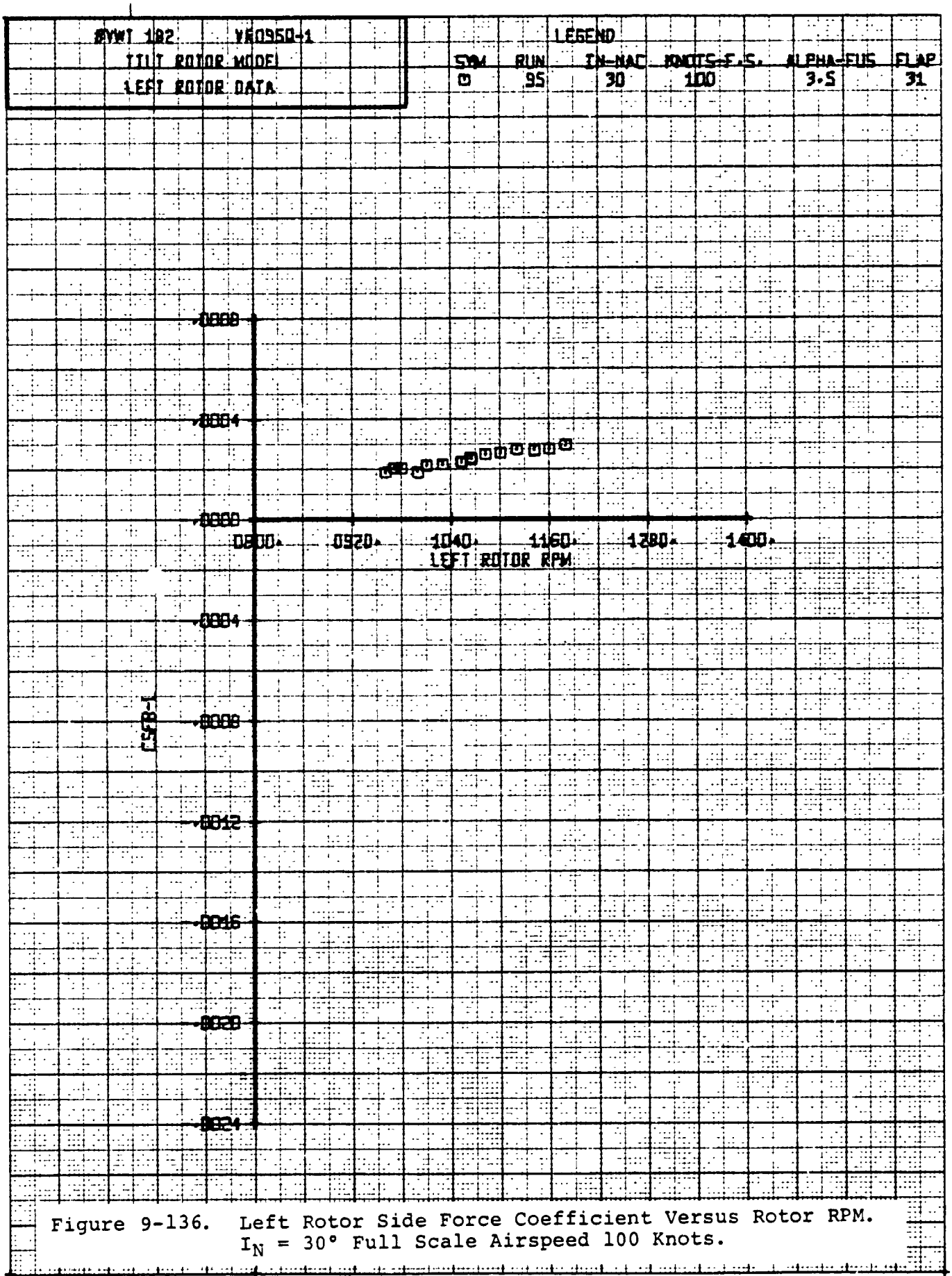

Figure 9-136. Left Rotor Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

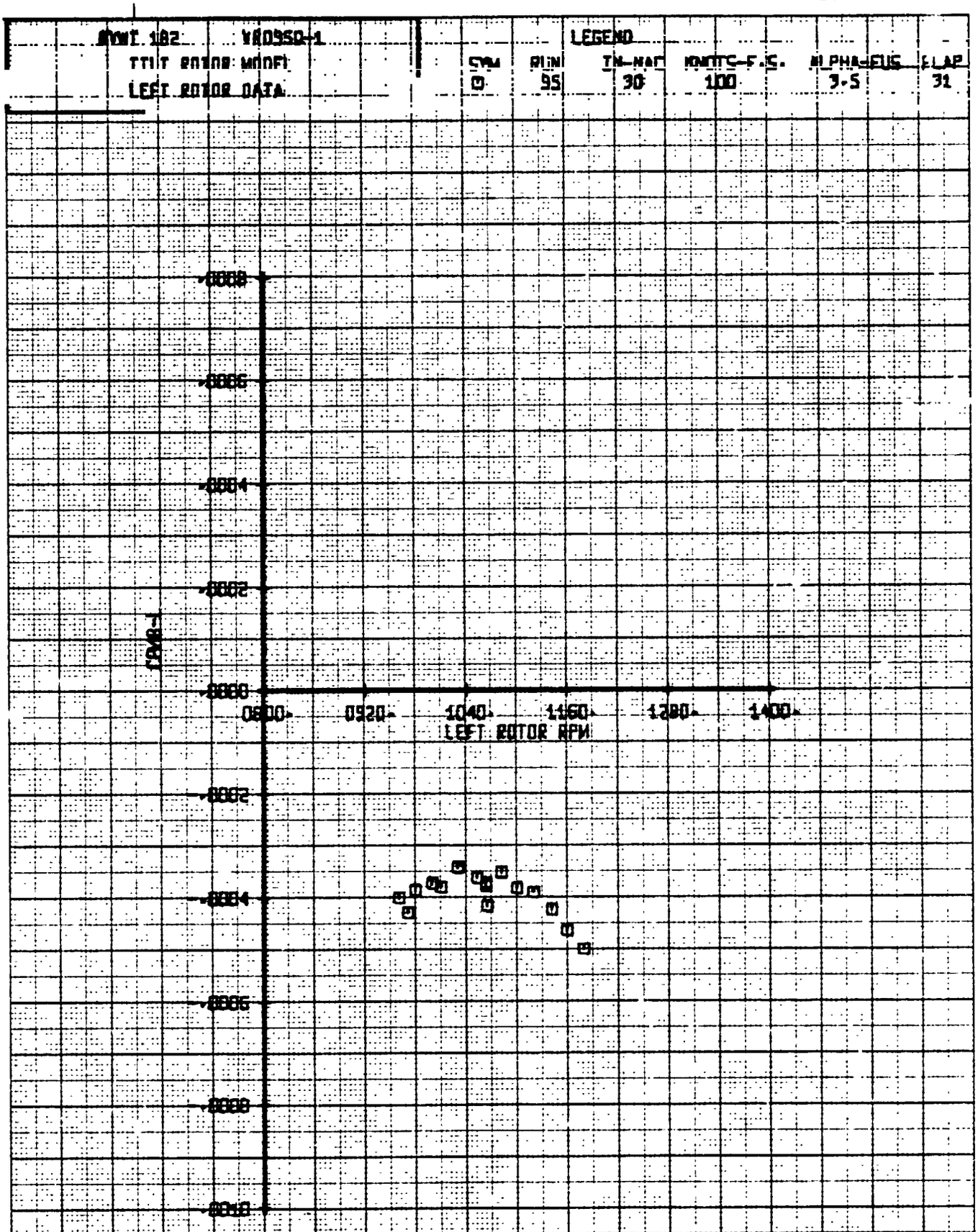

Figure 9-137. Left Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

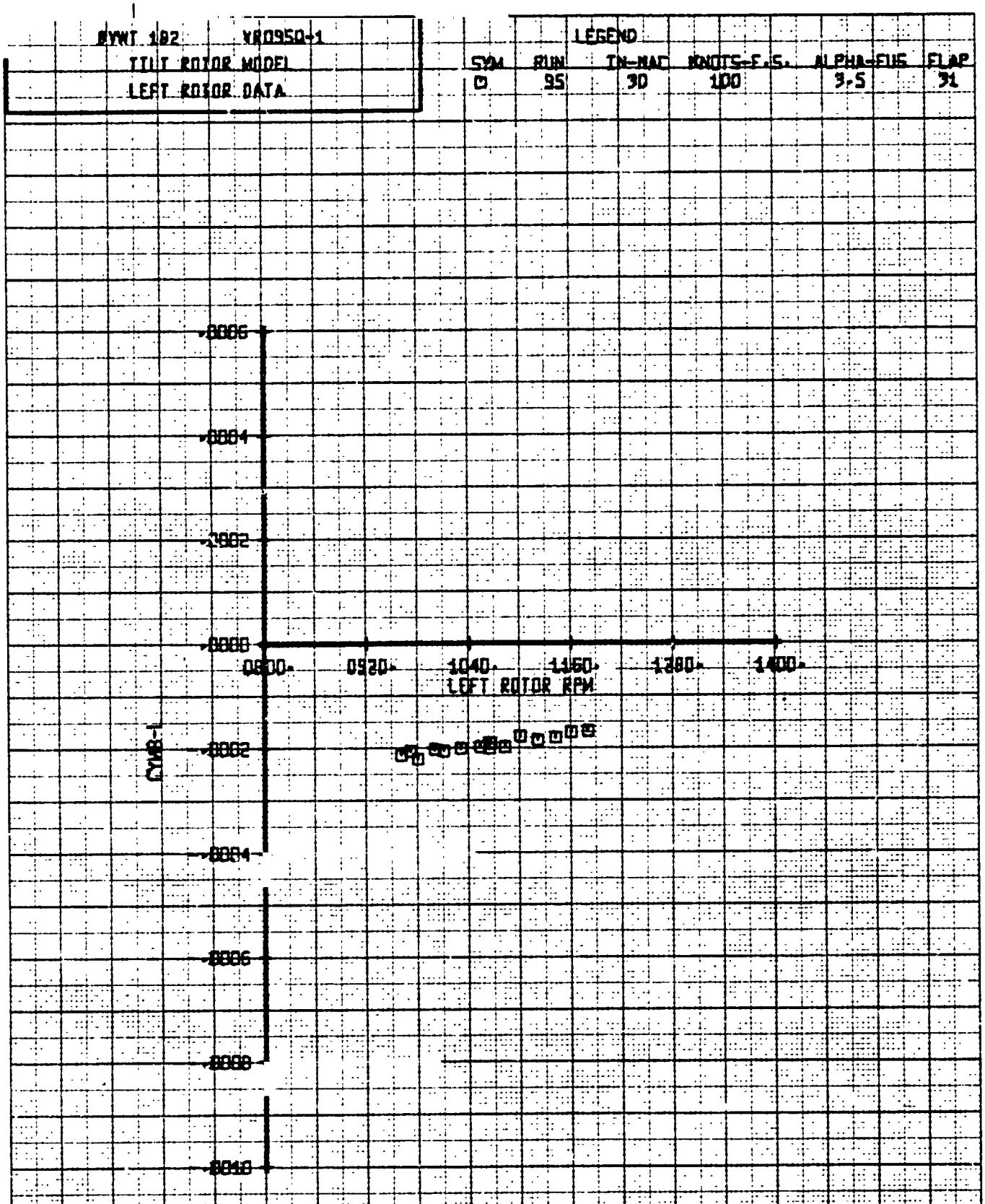

Figure 9-138. Left Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

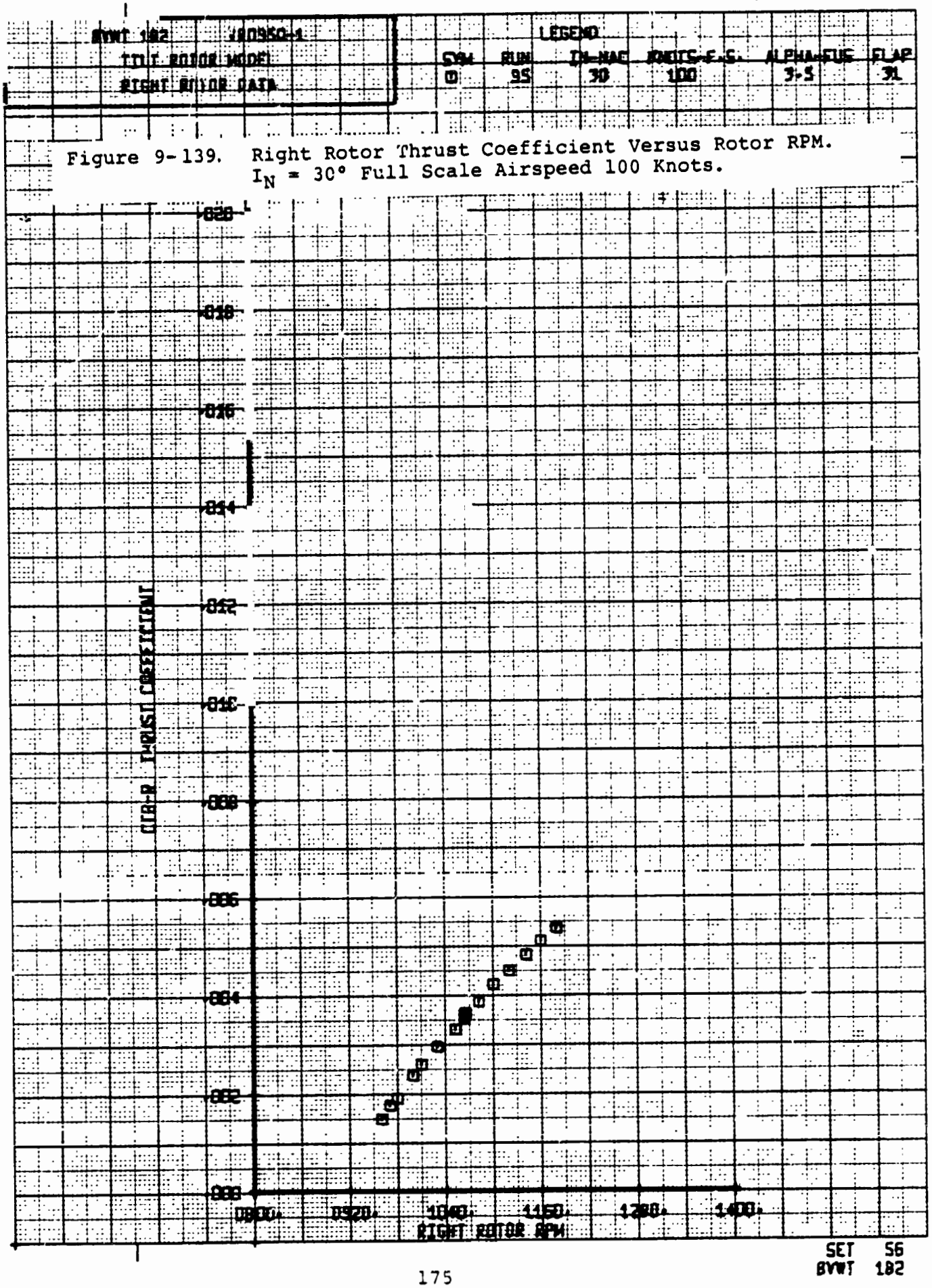

Figure 9-139. Right Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

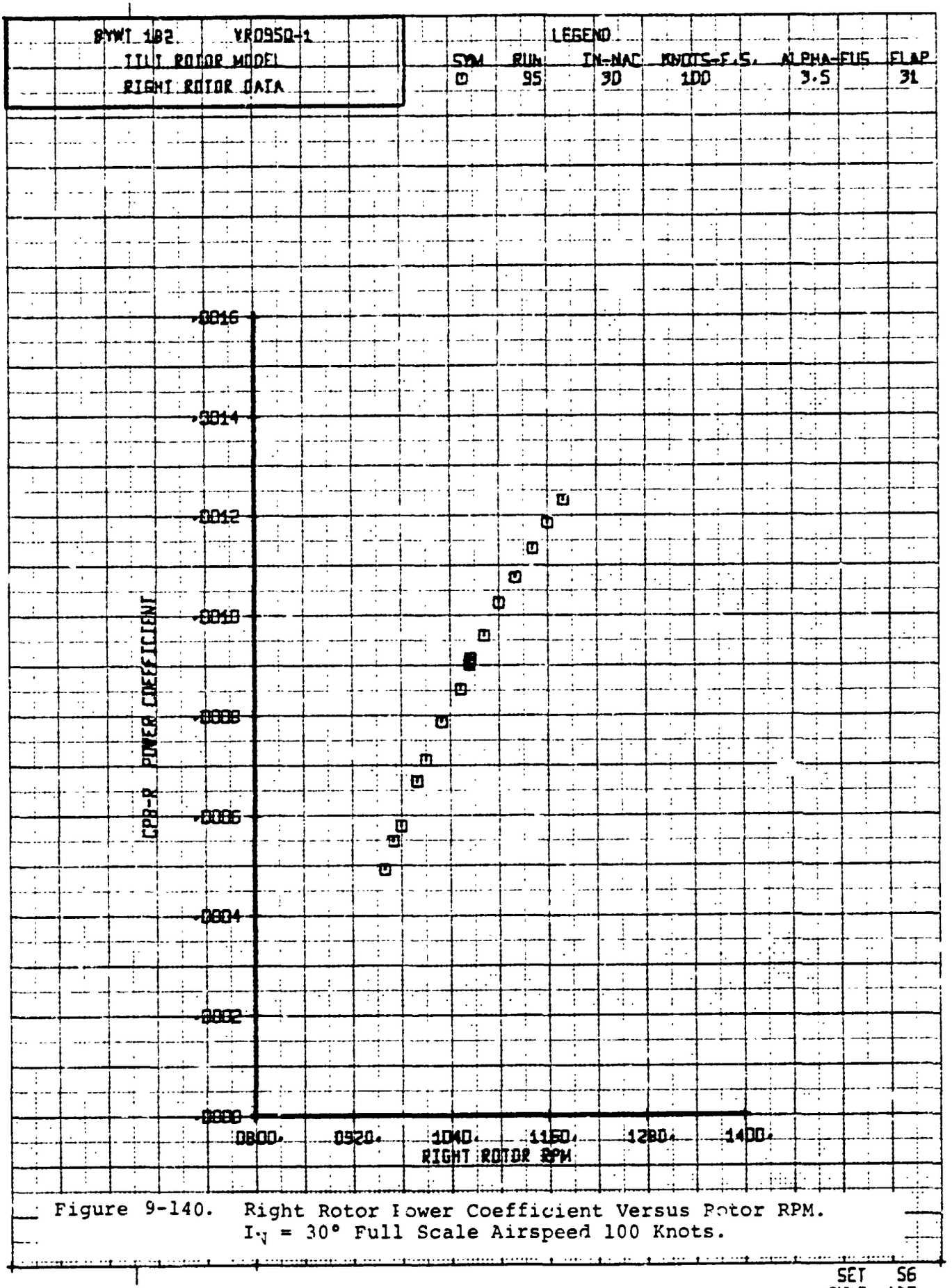

Figure 9-140. Right Rotor Power Coefficient Versus Rotor RPM. I_V = 30° Full Scale Airspeed 100 Knots.

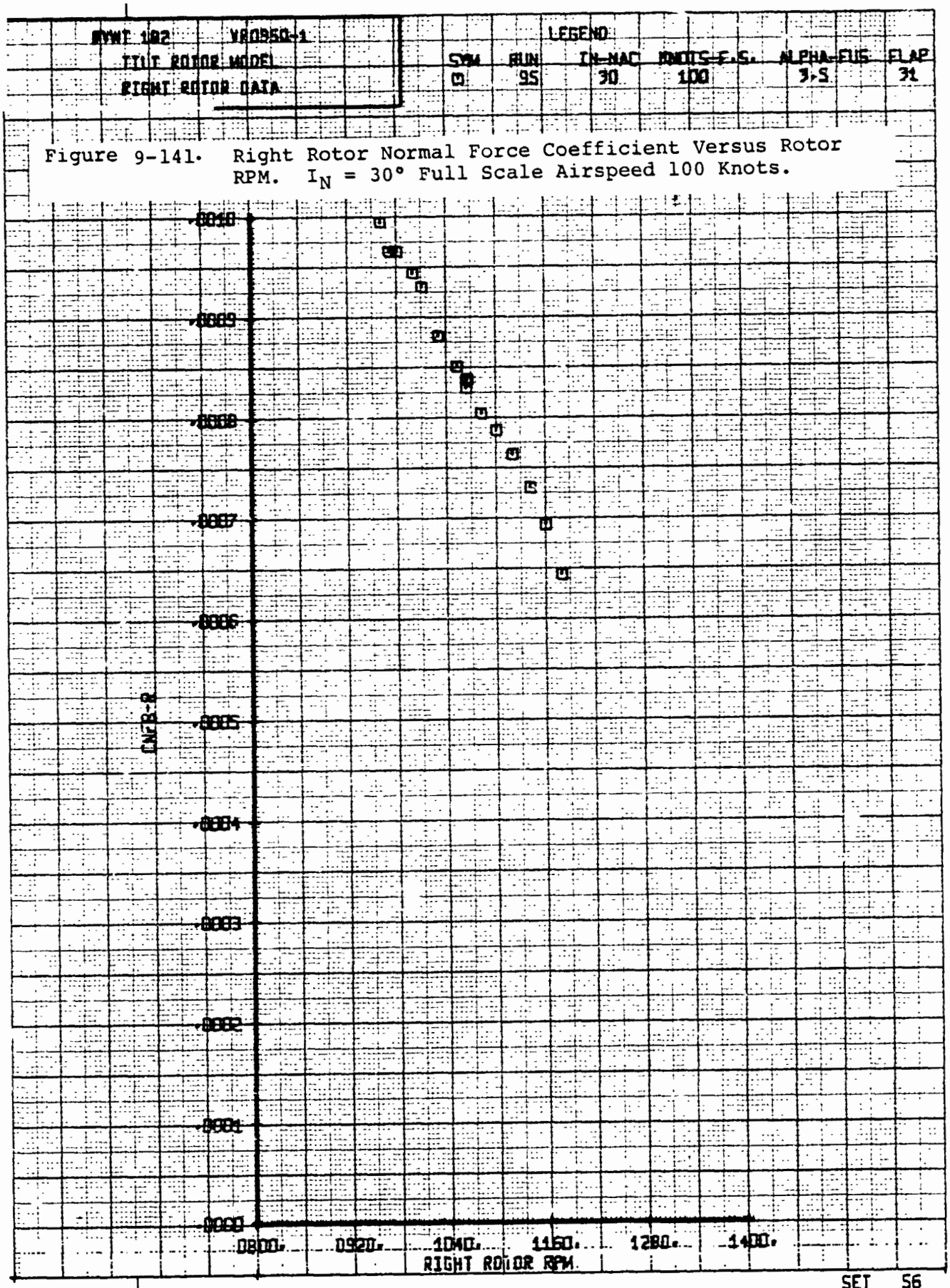

Figure 9-141. Right Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

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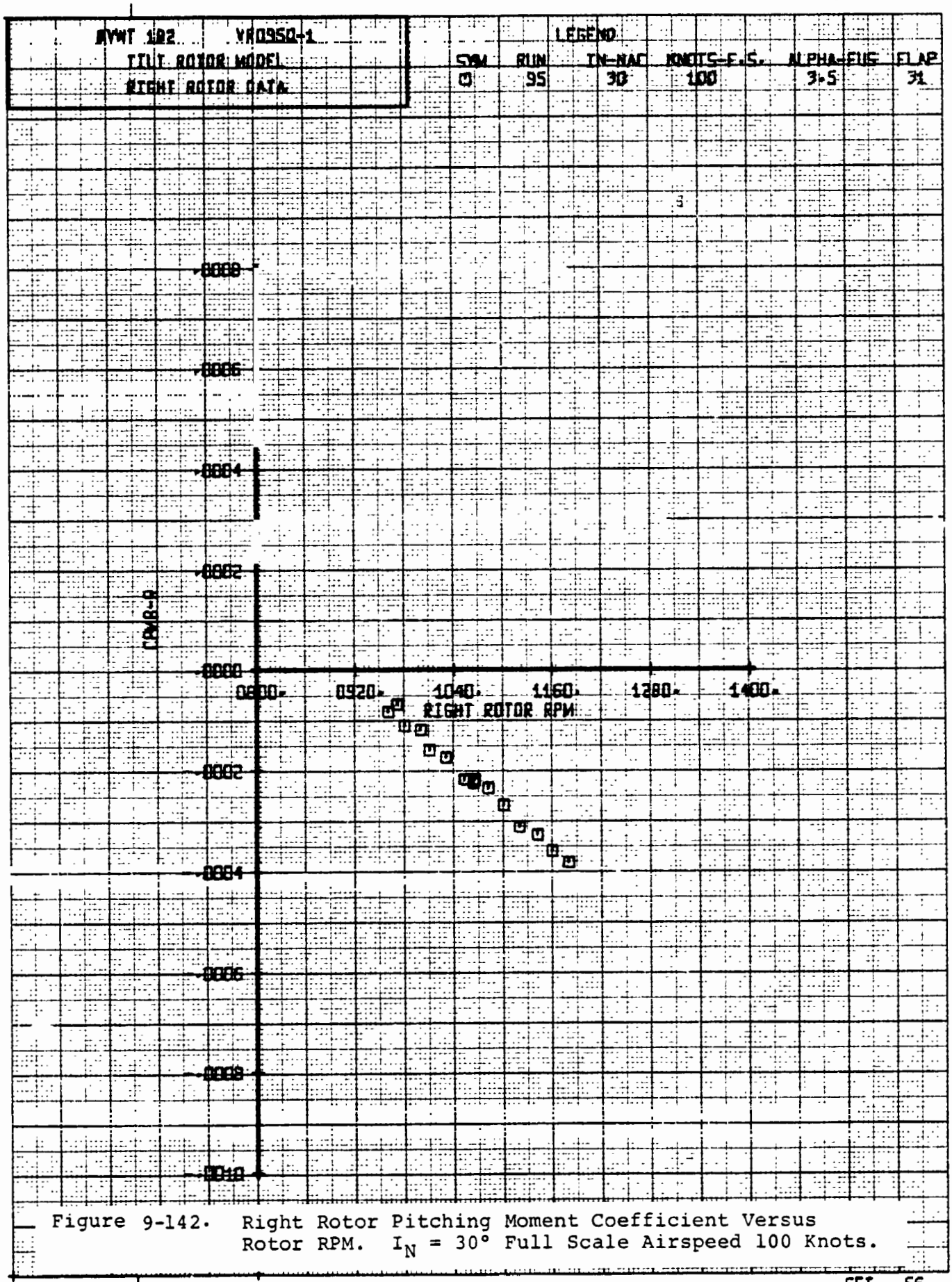

Figure 9-142. Right Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

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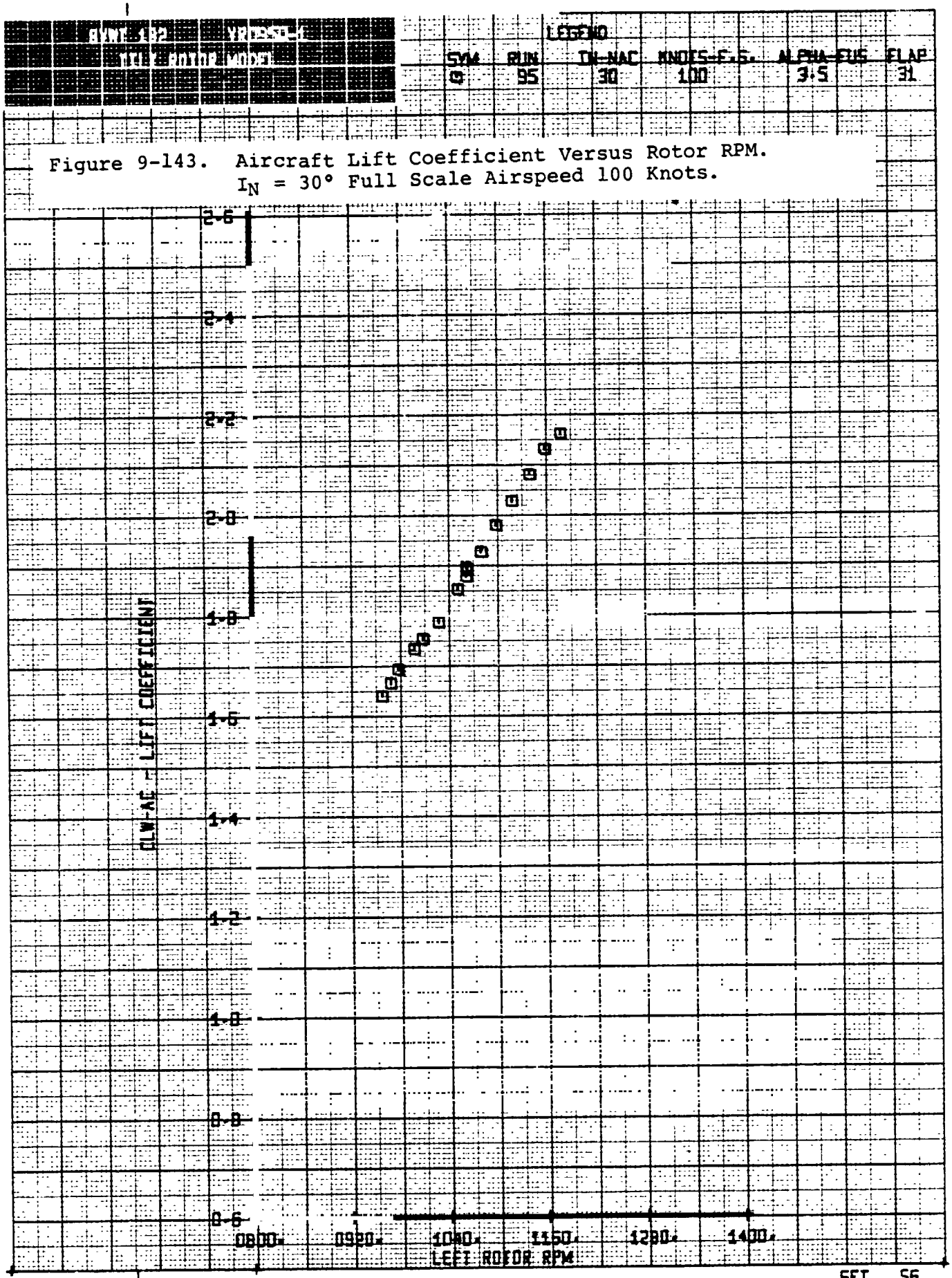

Figure 9-143. Aircraft Lift Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

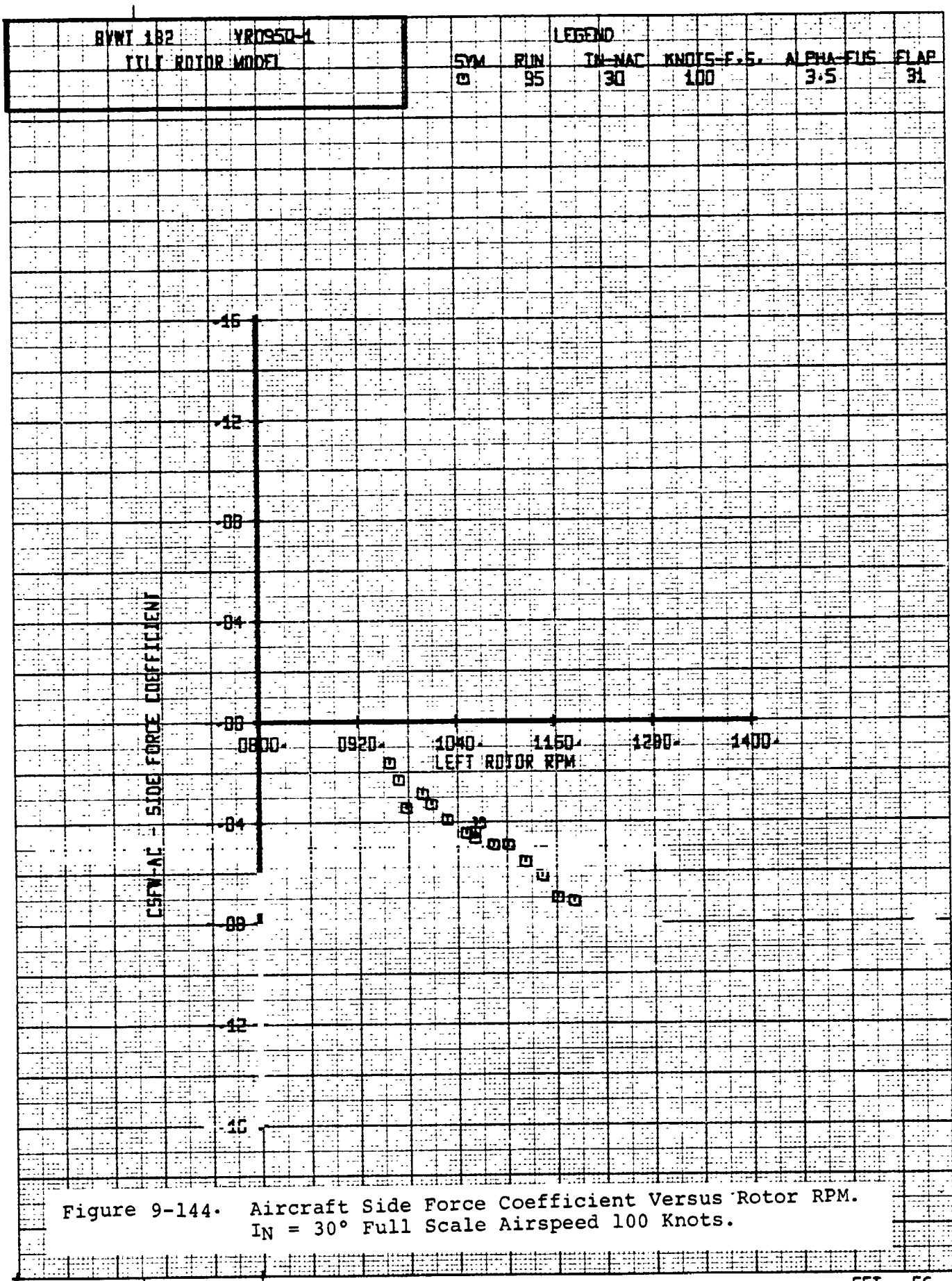

Figure 9-144. Aircraft Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

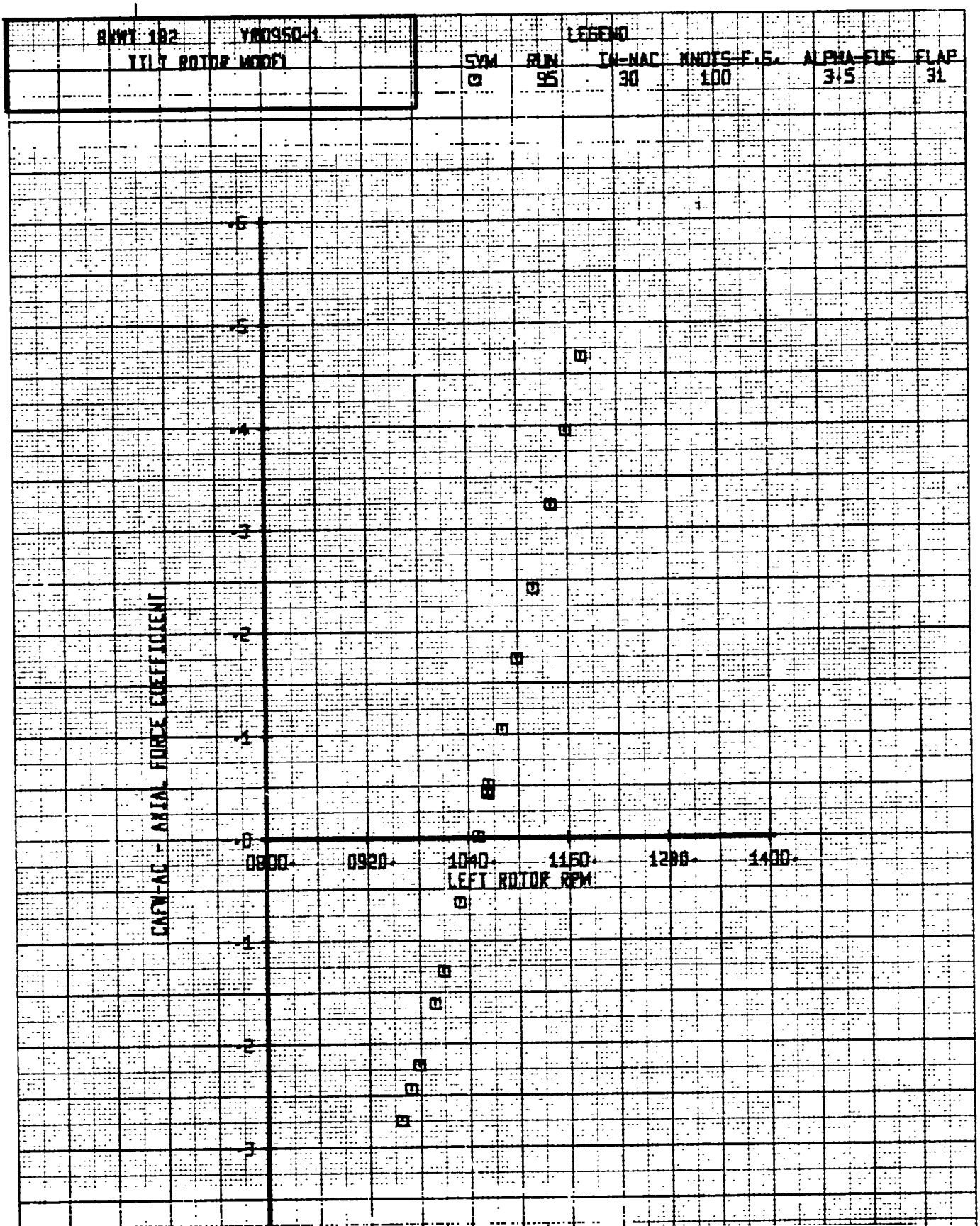

Figure 9-145. Aircraft Axial Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

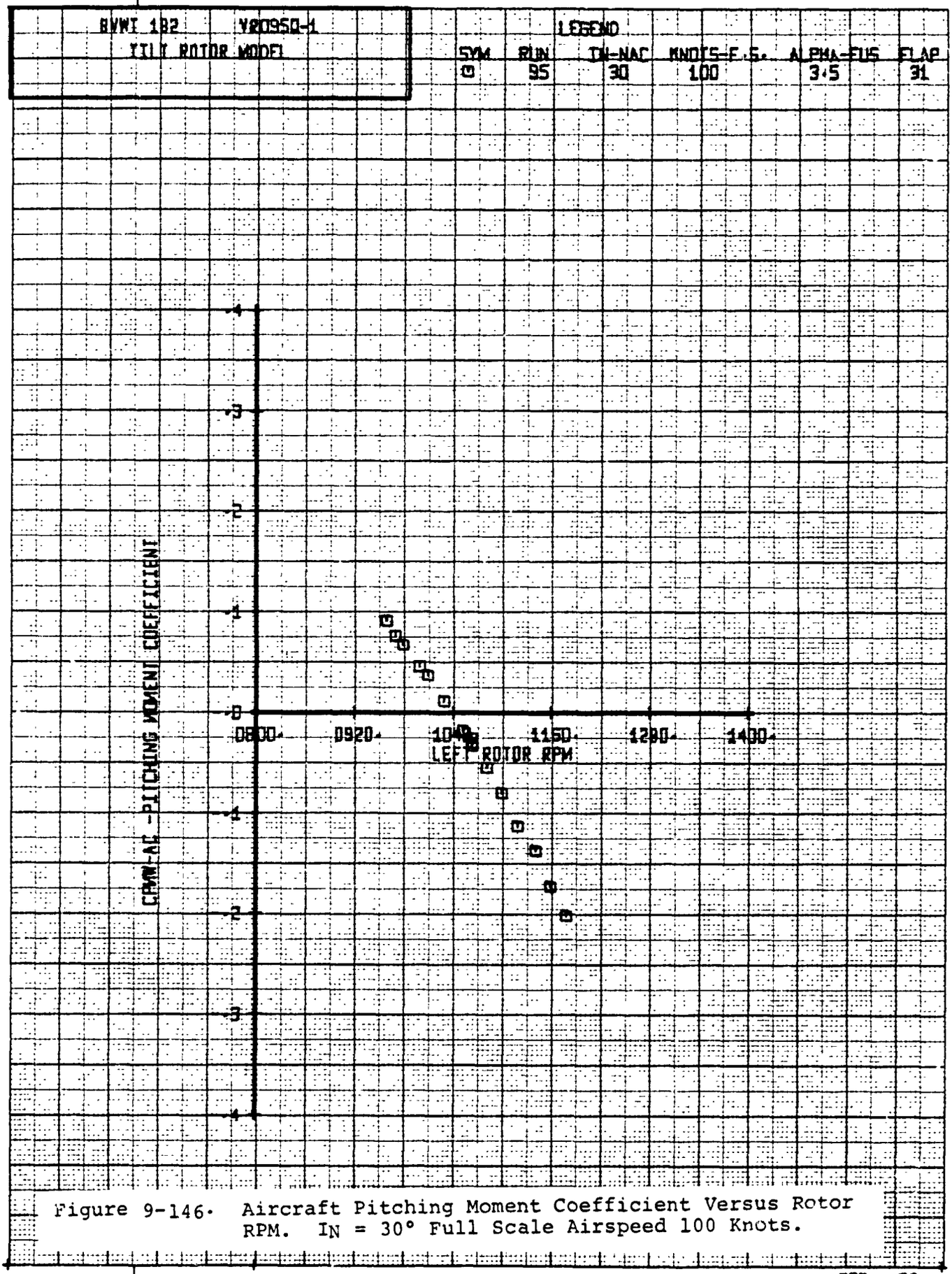

Figure 9-146. Aircraft Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

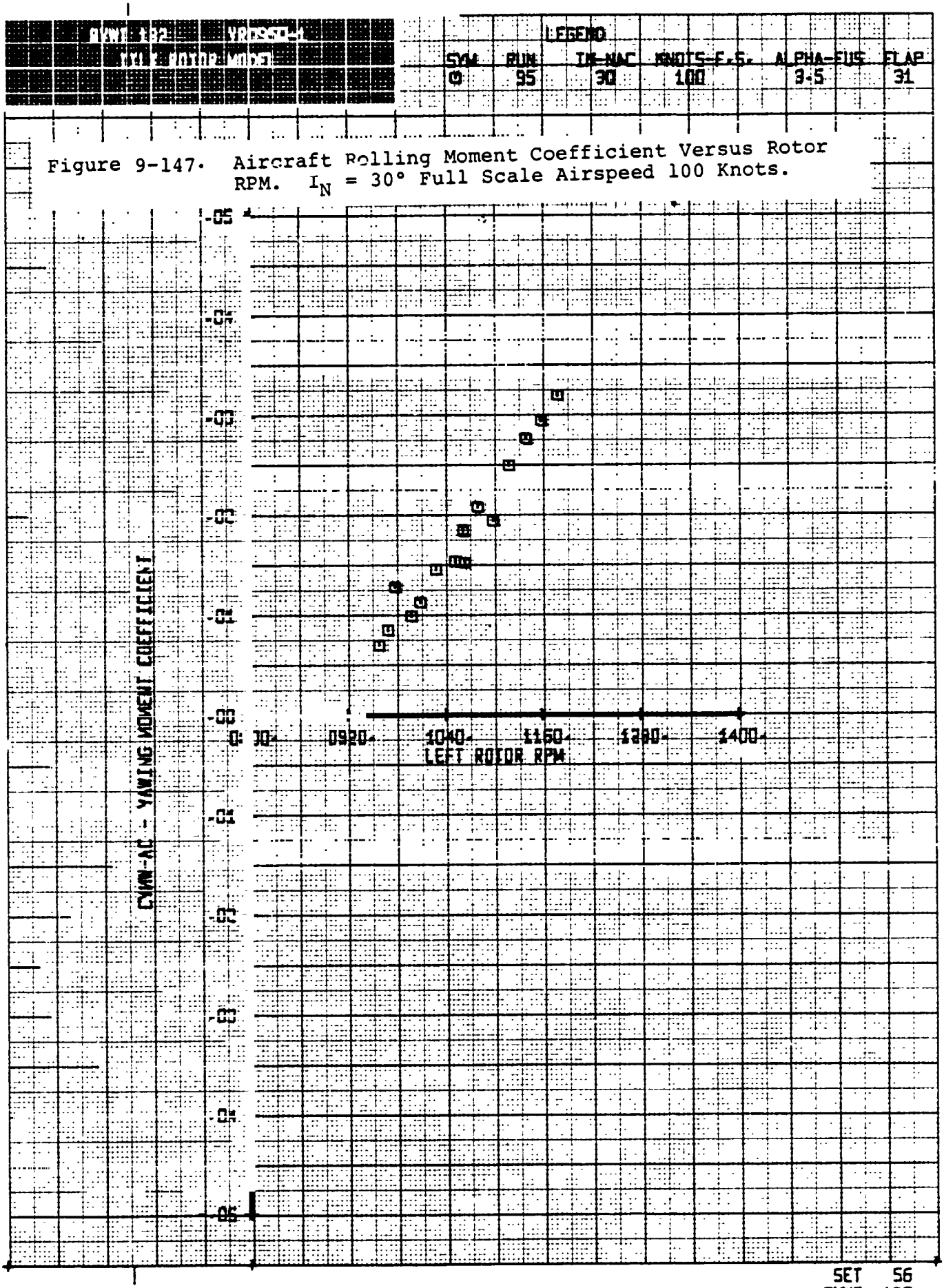

Figure 9-147. Aircraft Rolling Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

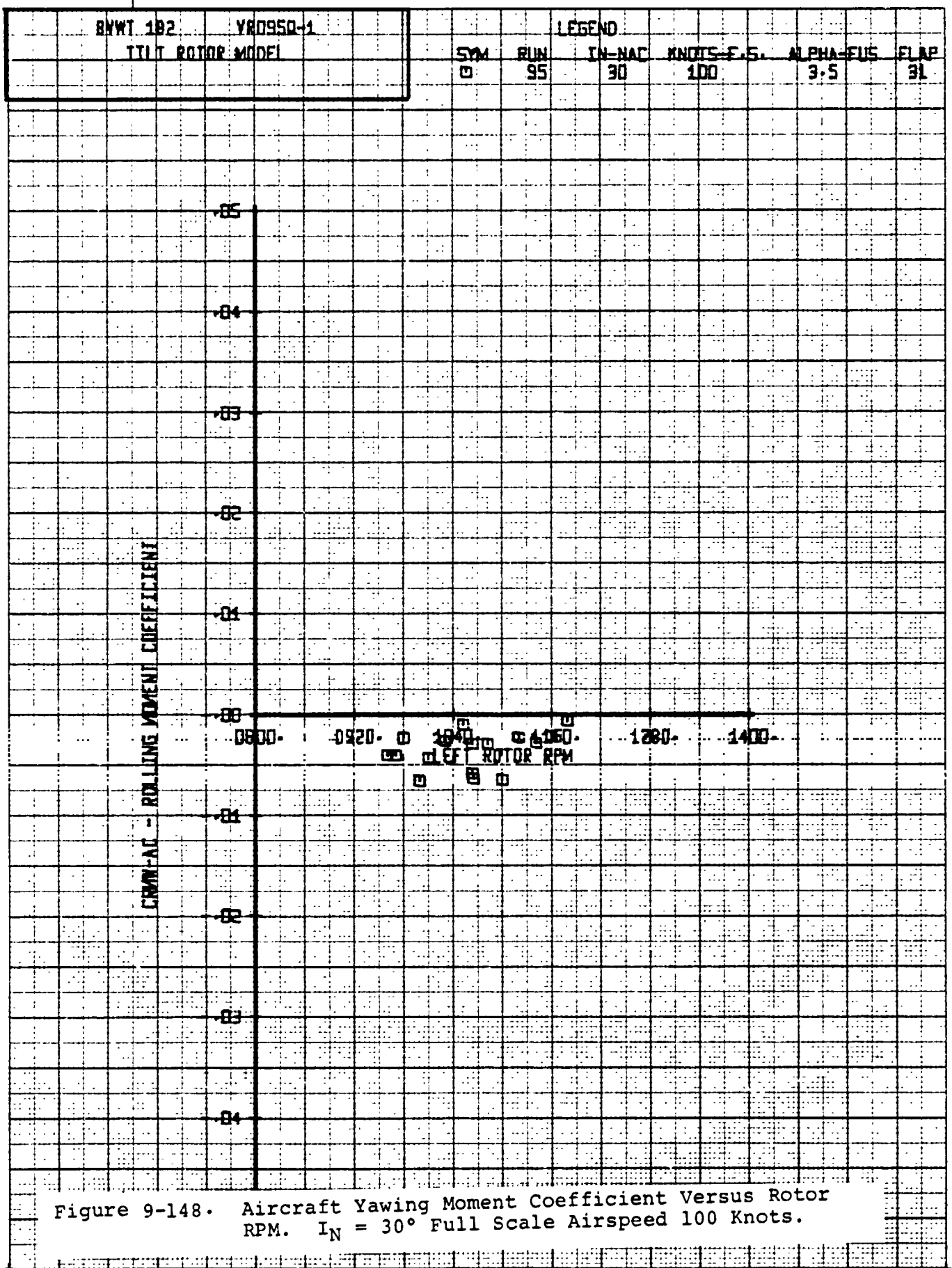

Figure 9-148. Aircraft Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

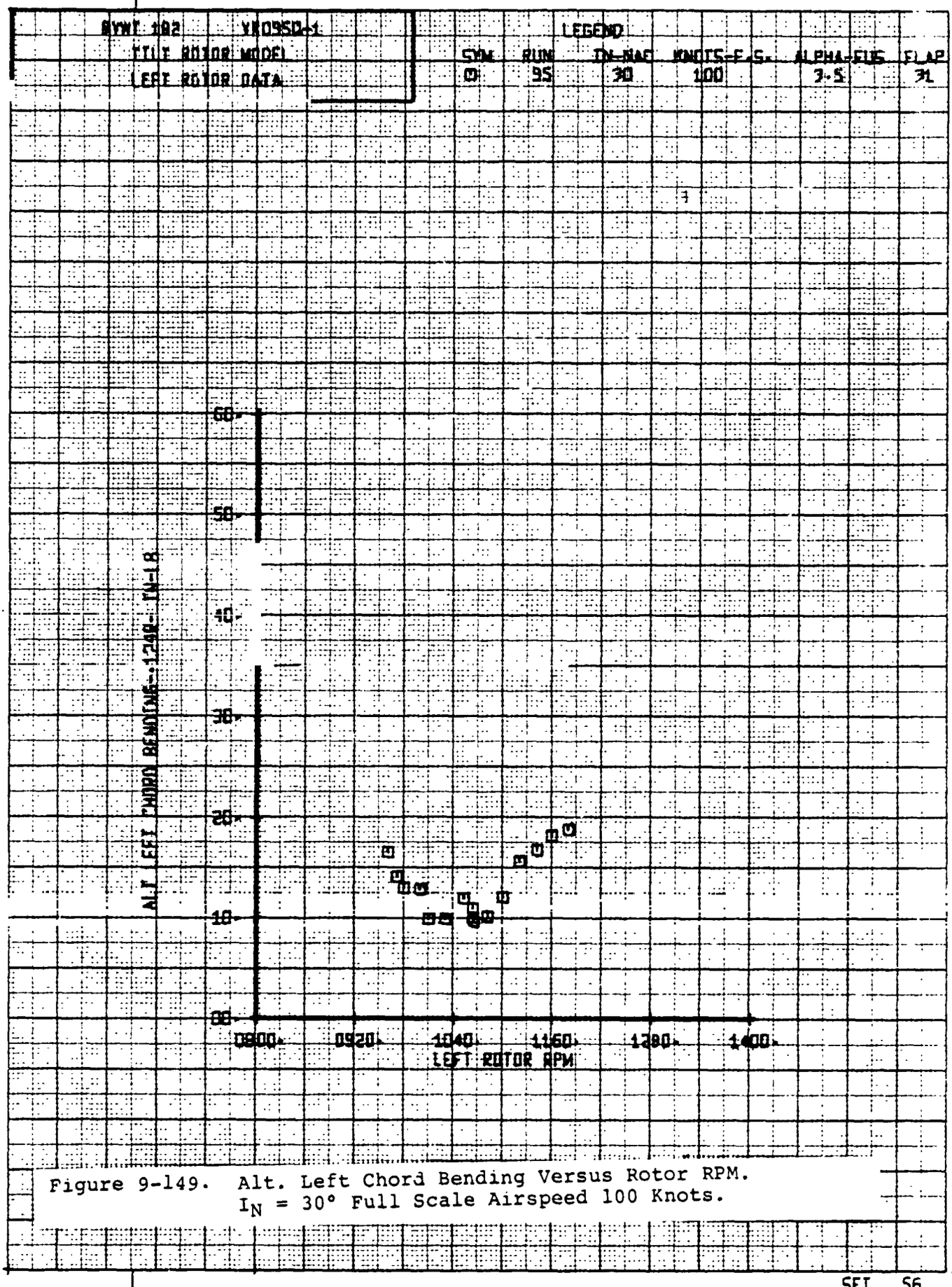

Figure 9-149. Alt. Left Chord Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

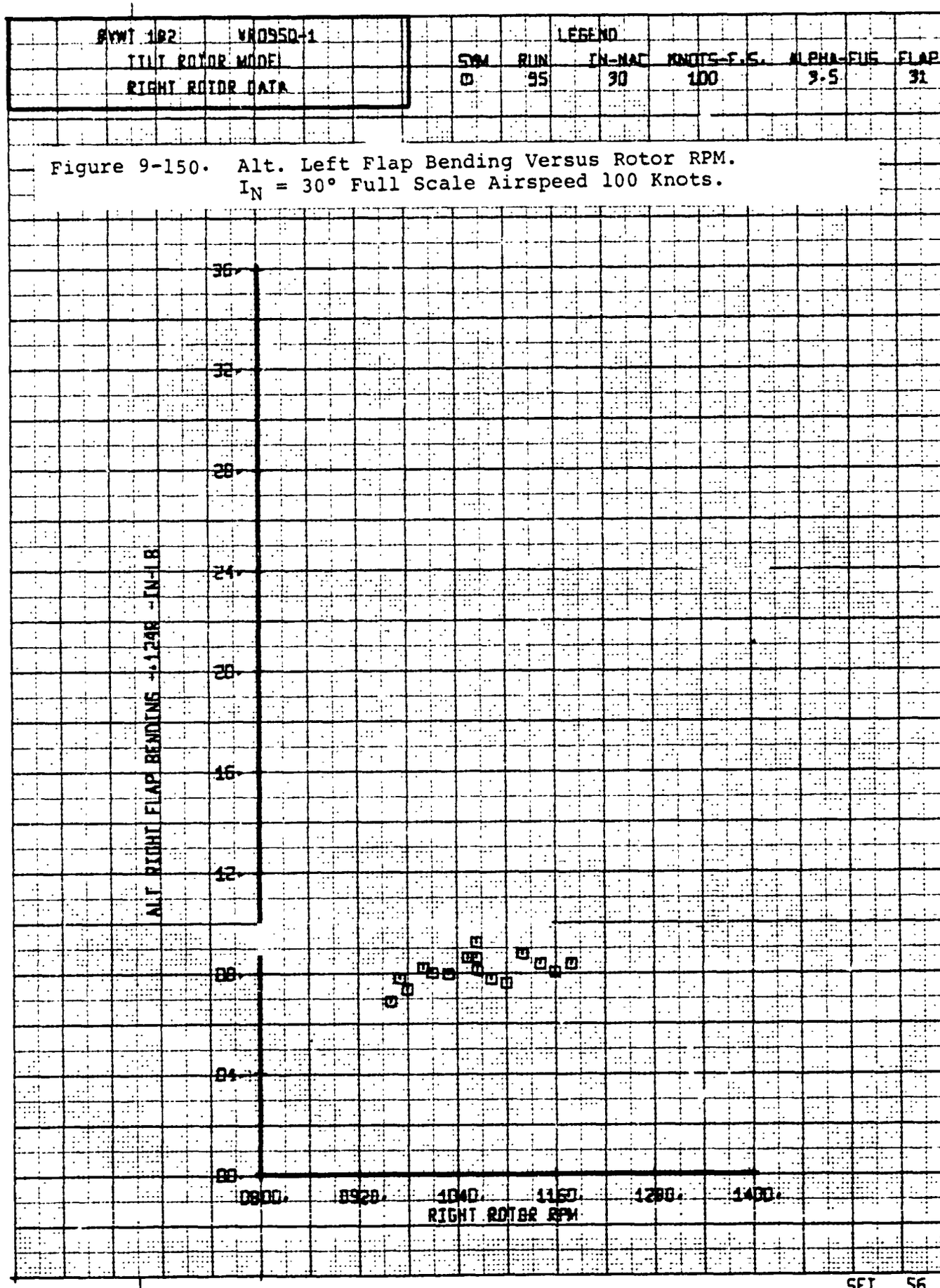

Figure 9-150. Alt. Left Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

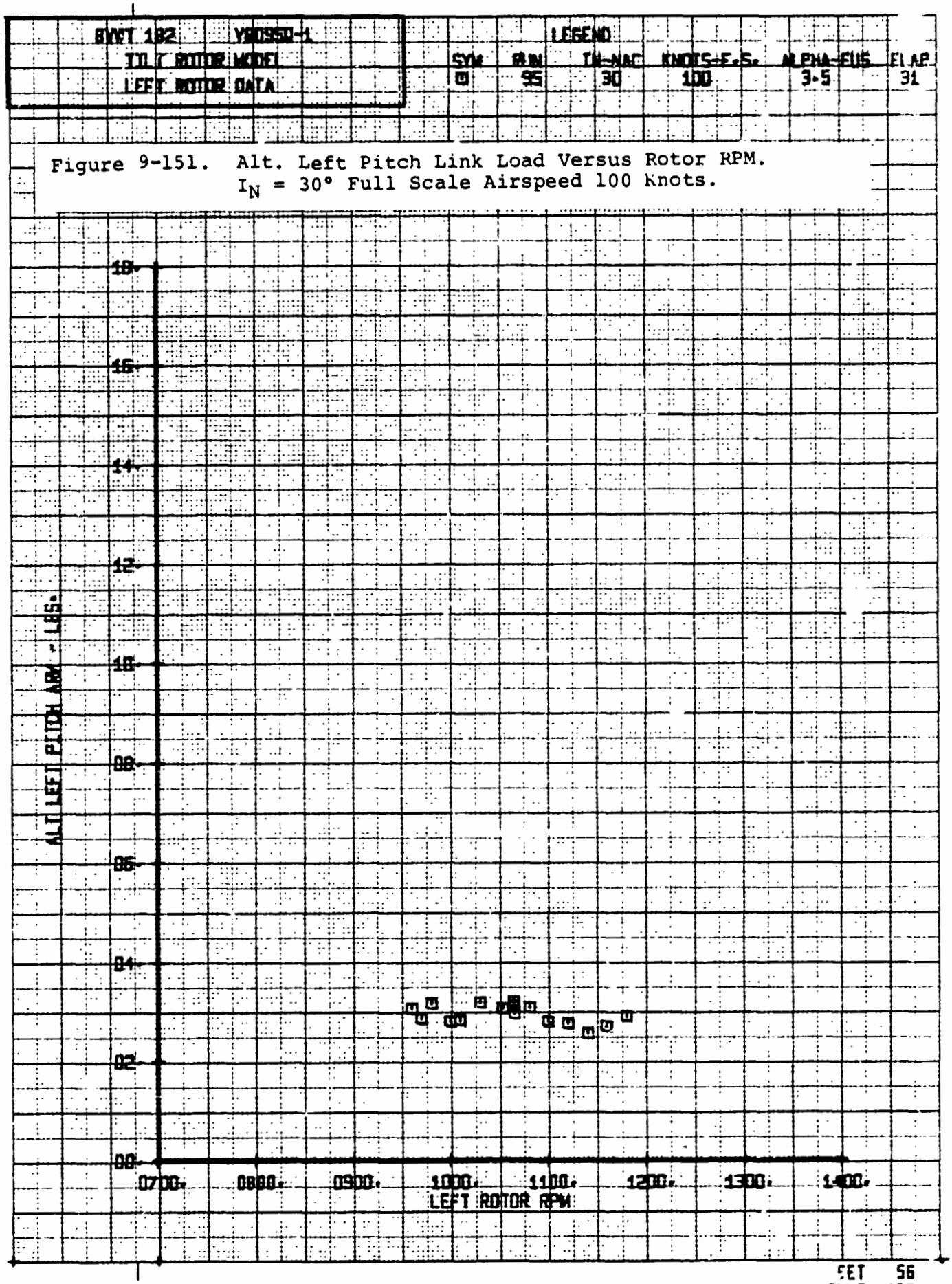

Figure 9-151. Alt. Left Pitch Link Load Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

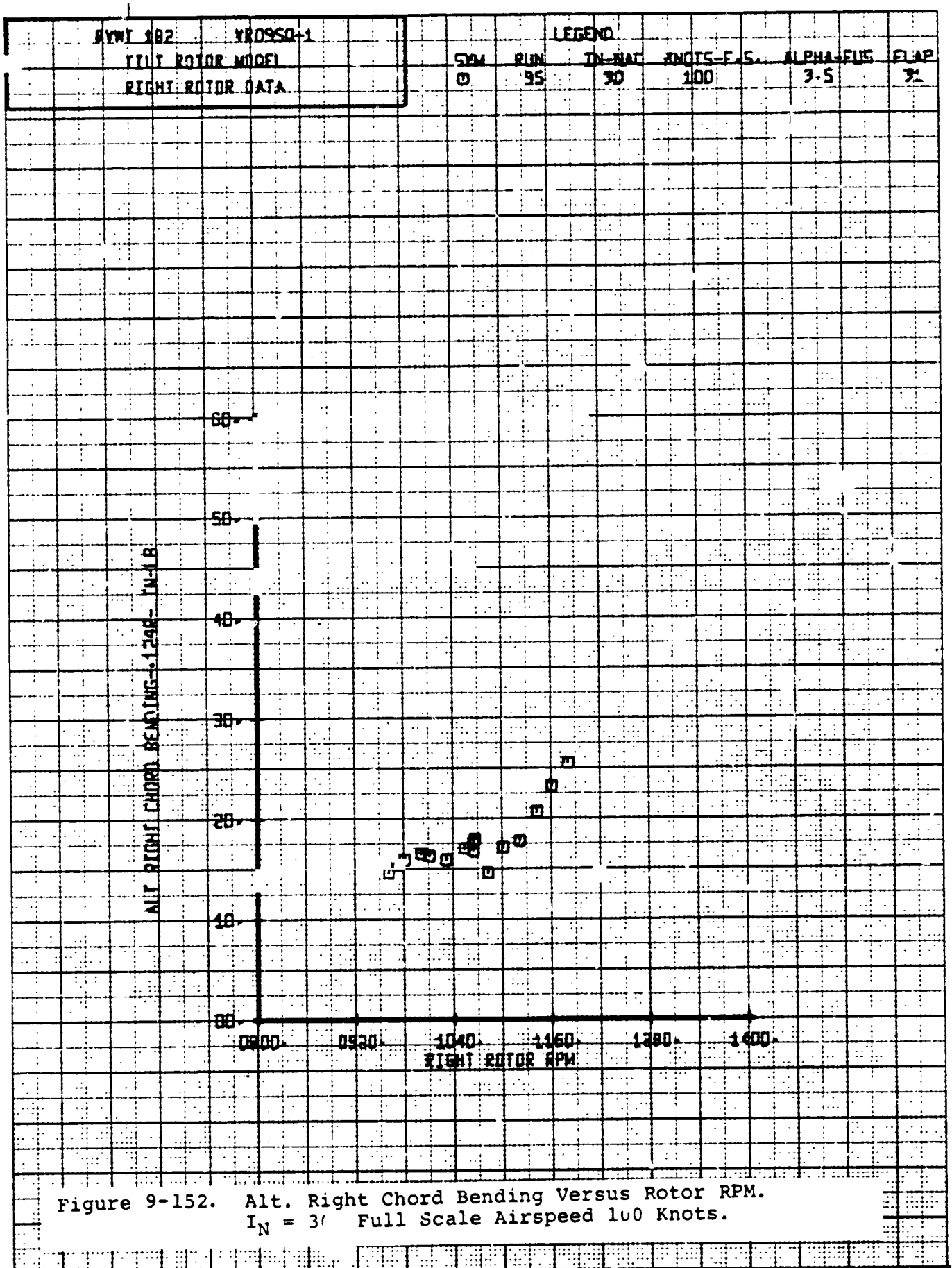

Figure 9-152. Alt. Right Chord Bending Versus Rotor RPM. I_N = 3° Full Scale Airspeed 100 Knots.

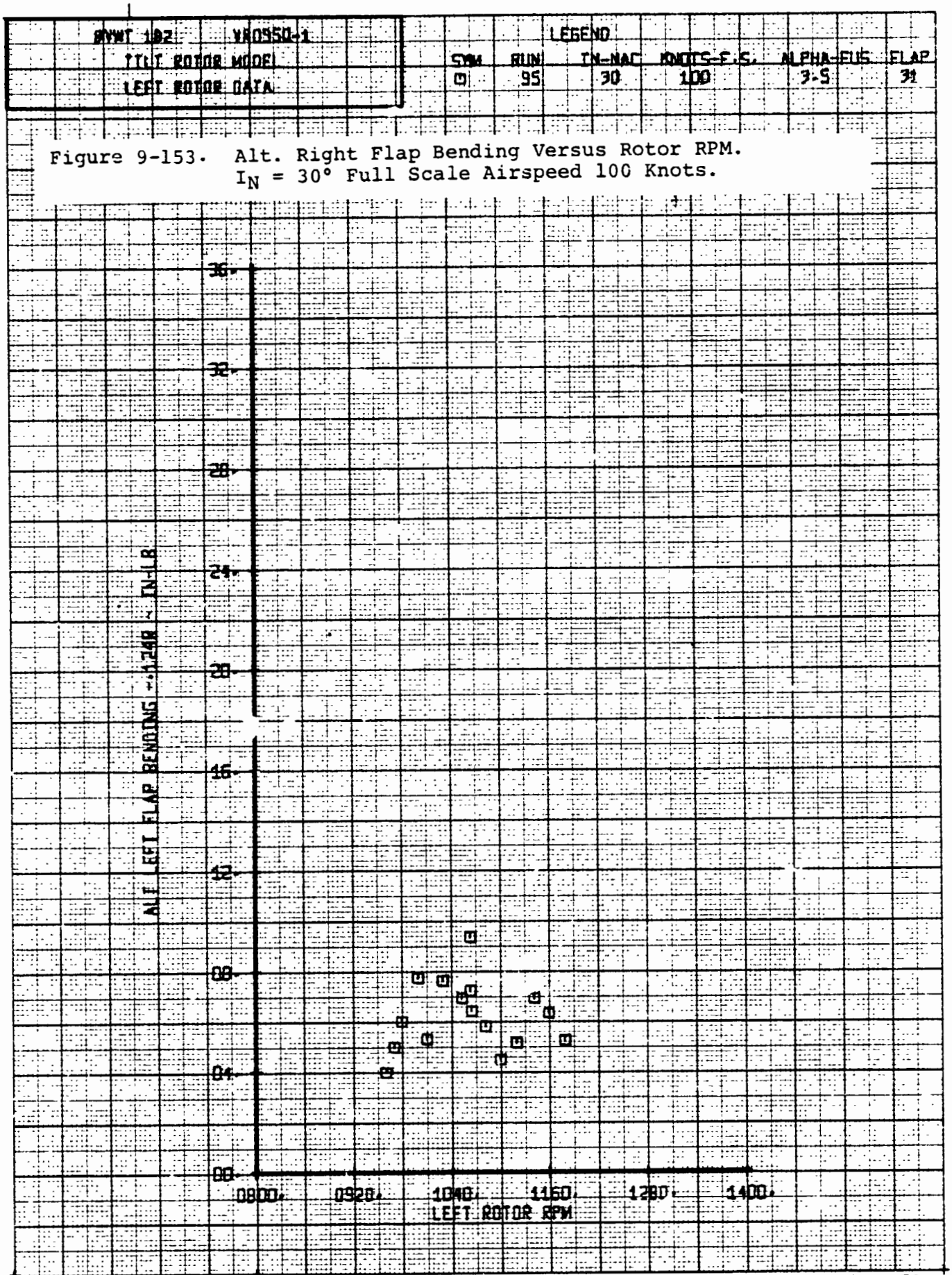

Figure 9-153. Alt. Right Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

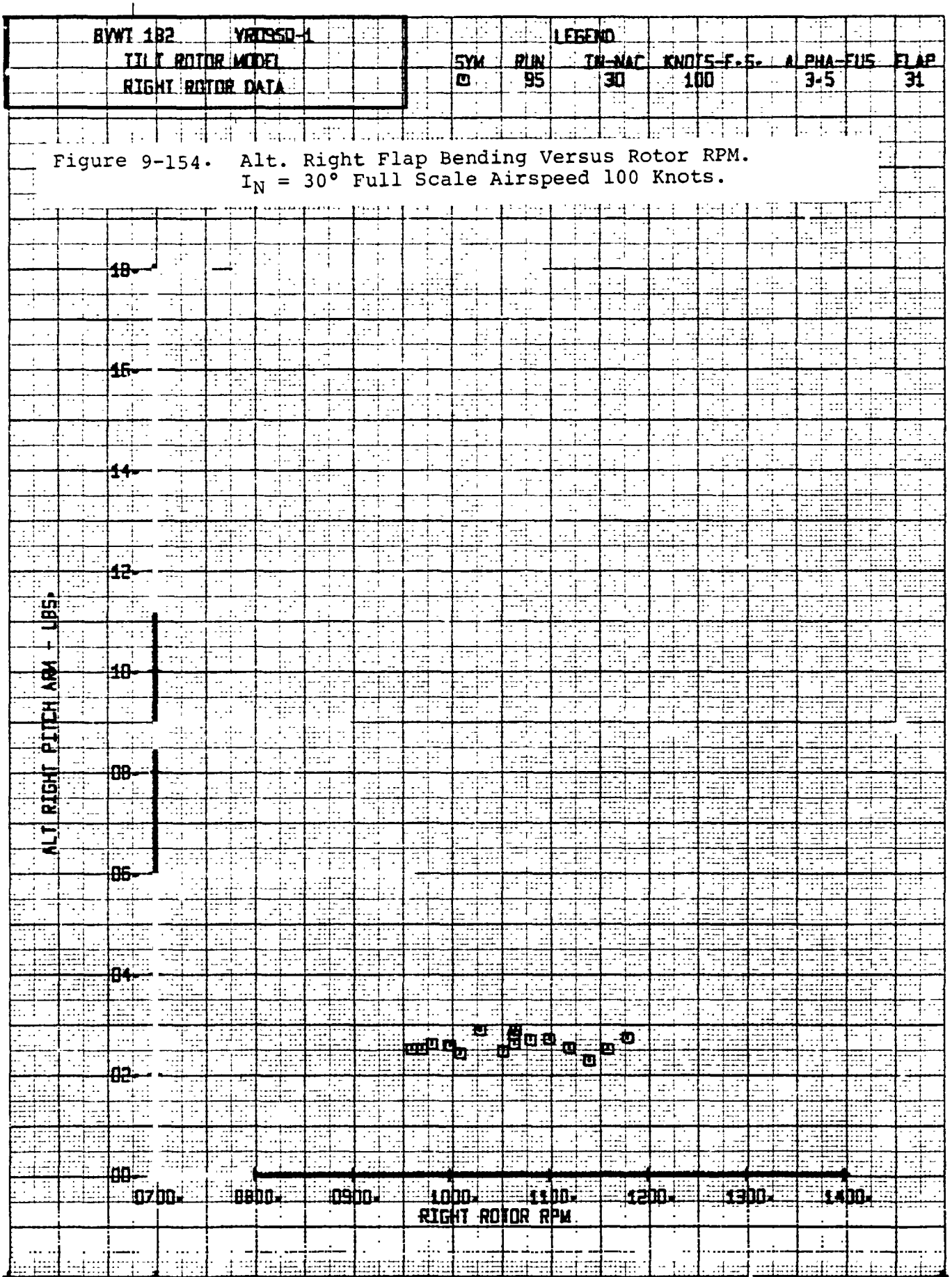

Figure 9-154. Alt. Right Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 100 Knots.

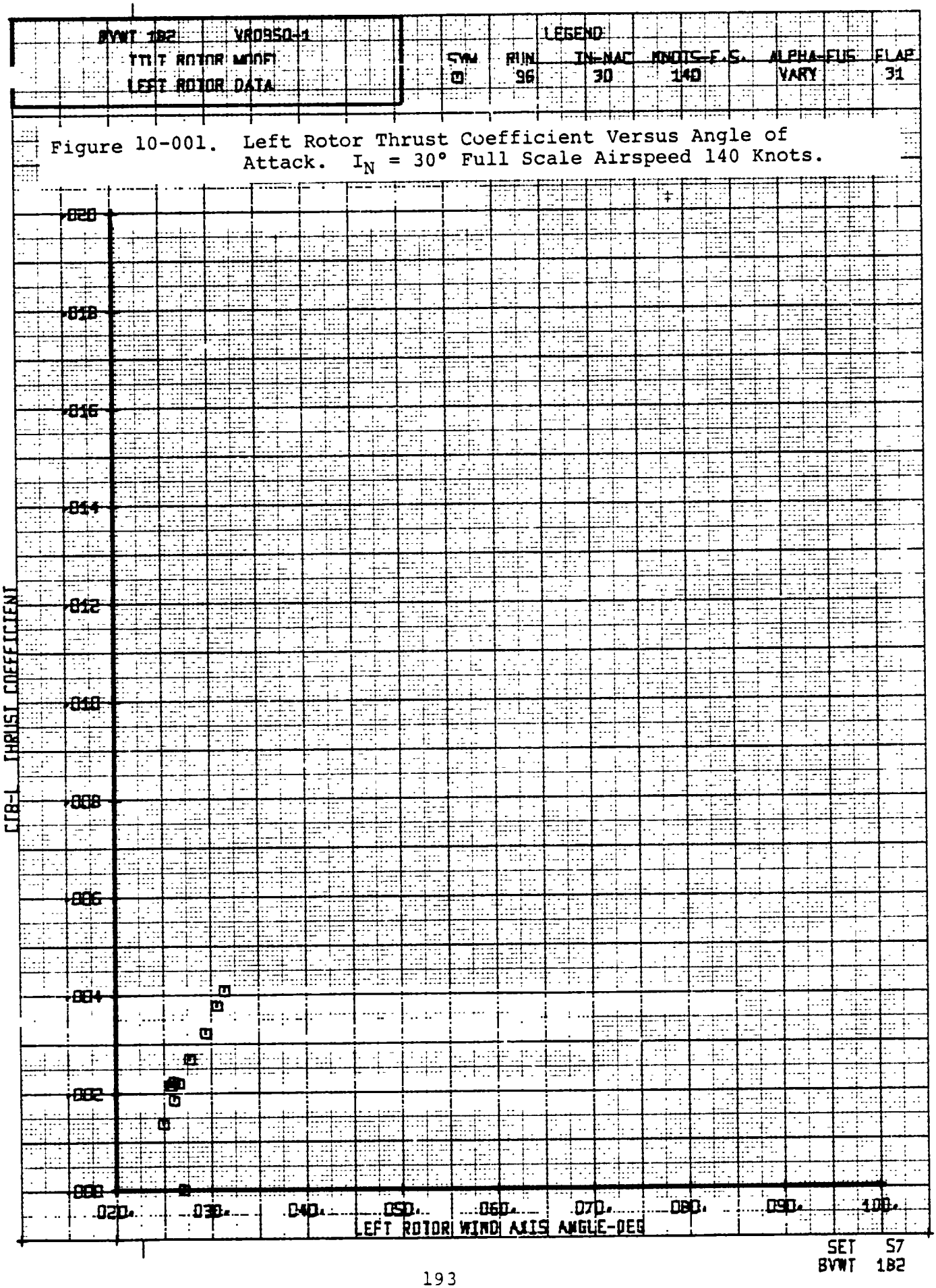

Figure 10-001. Left Rotor Thrust Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

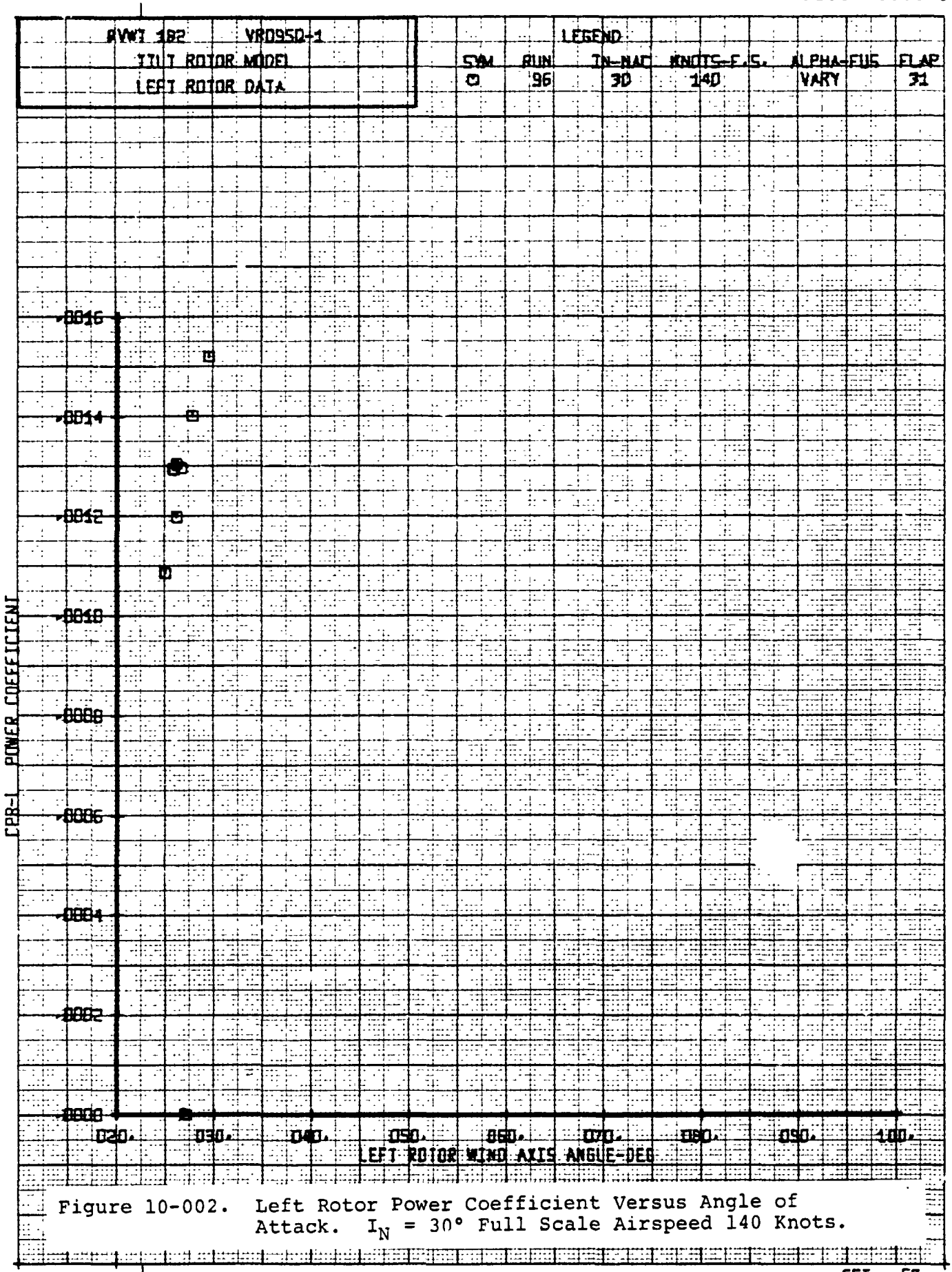

Figure 10-002. Left Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

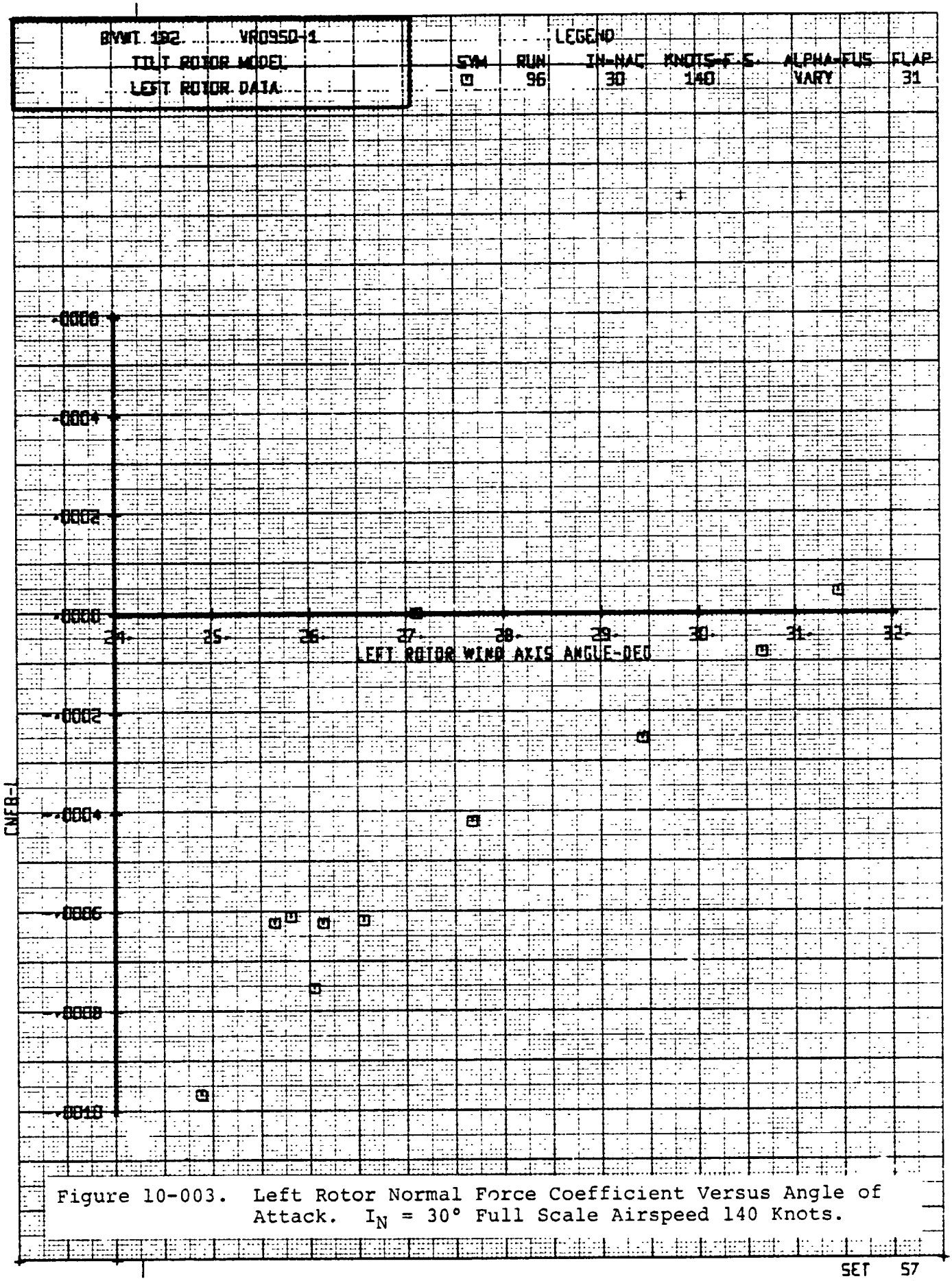

Figure 10-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

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182

SET S7
BVWT 182

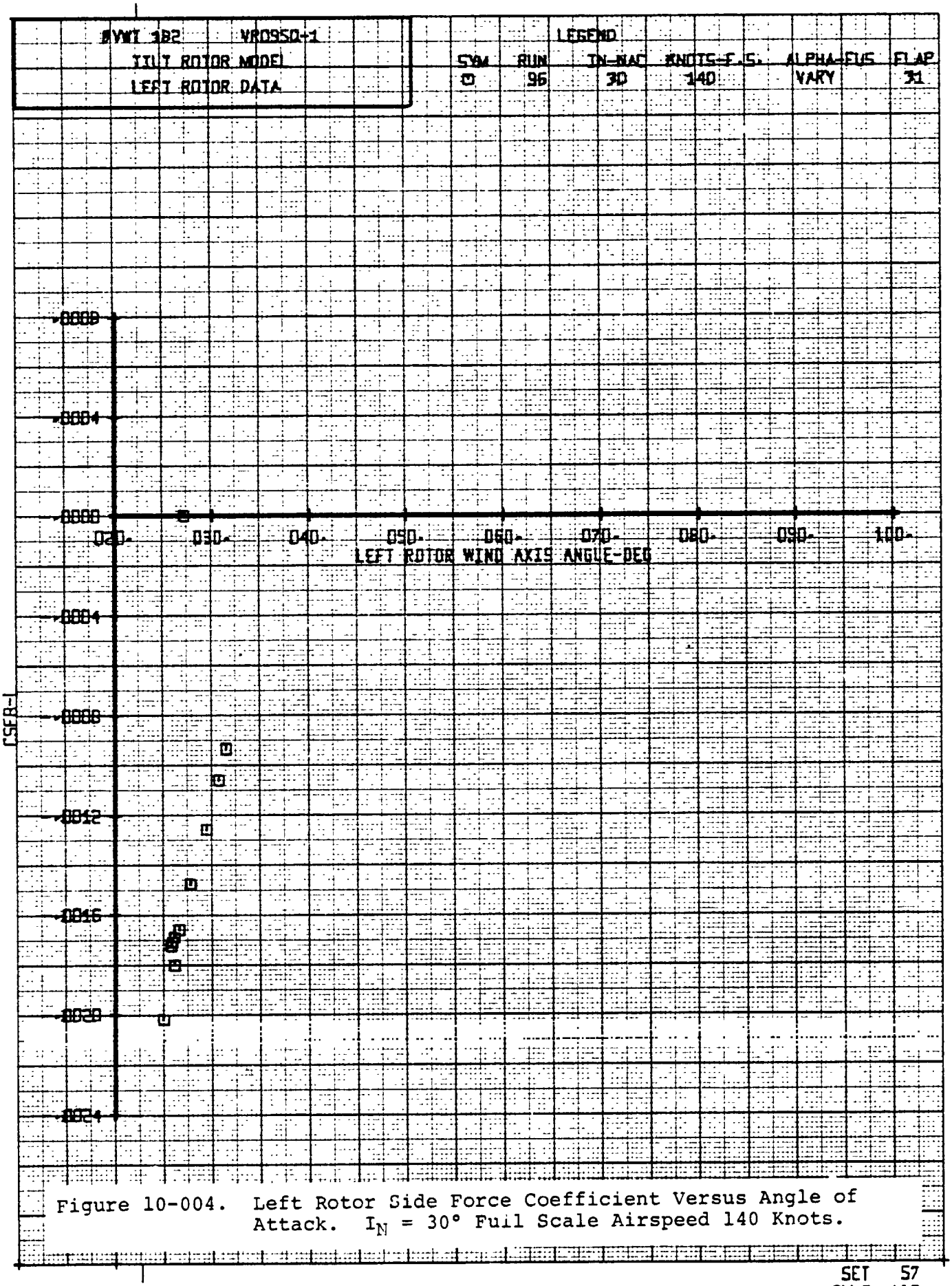


Figure 10-004. Left Rotor Side Force Coefficient Versus Angle of Attack. I_N = 30° Fuil Scale Airspeed 140 Knots.

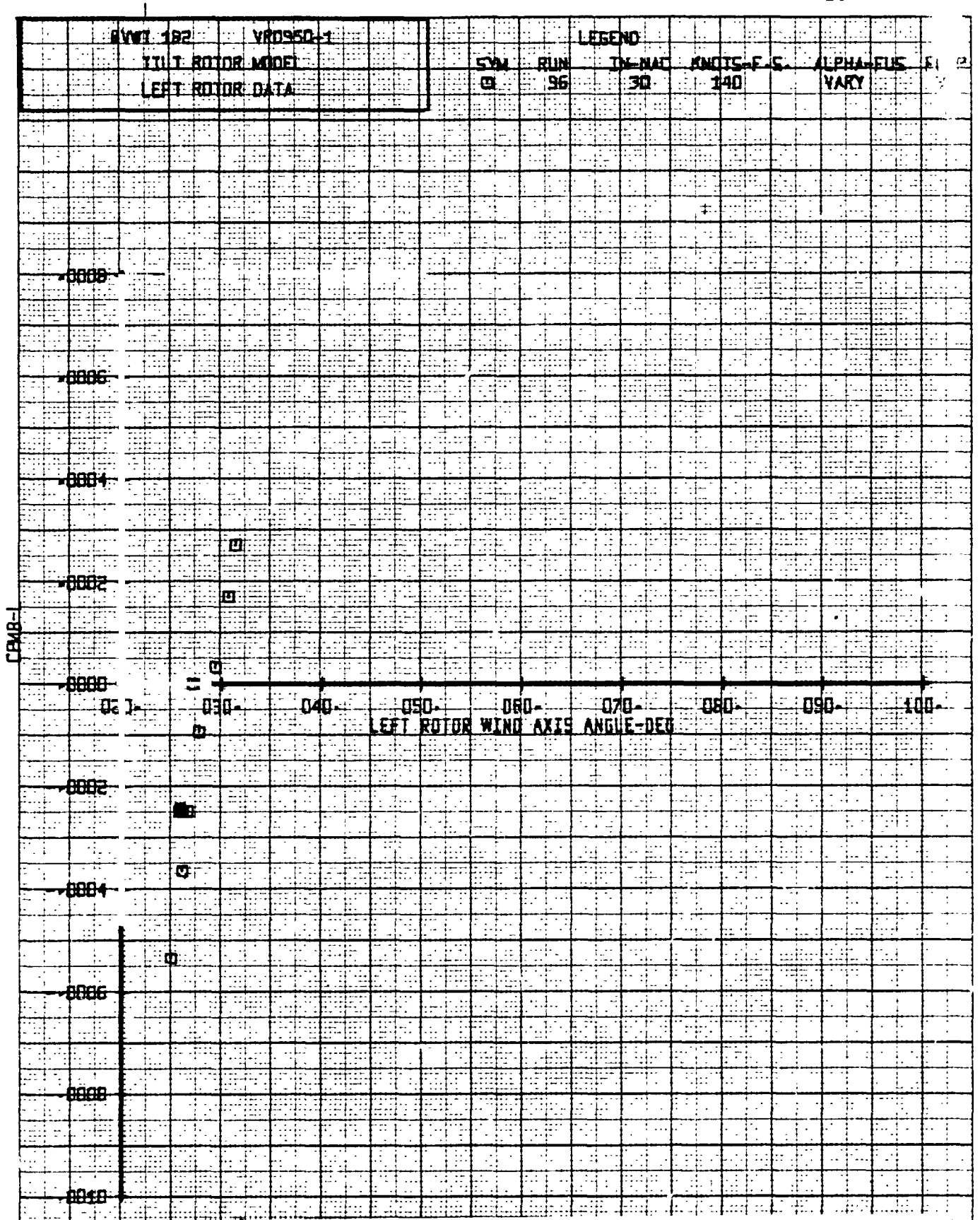


Figure 10-005. Left Rotor Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

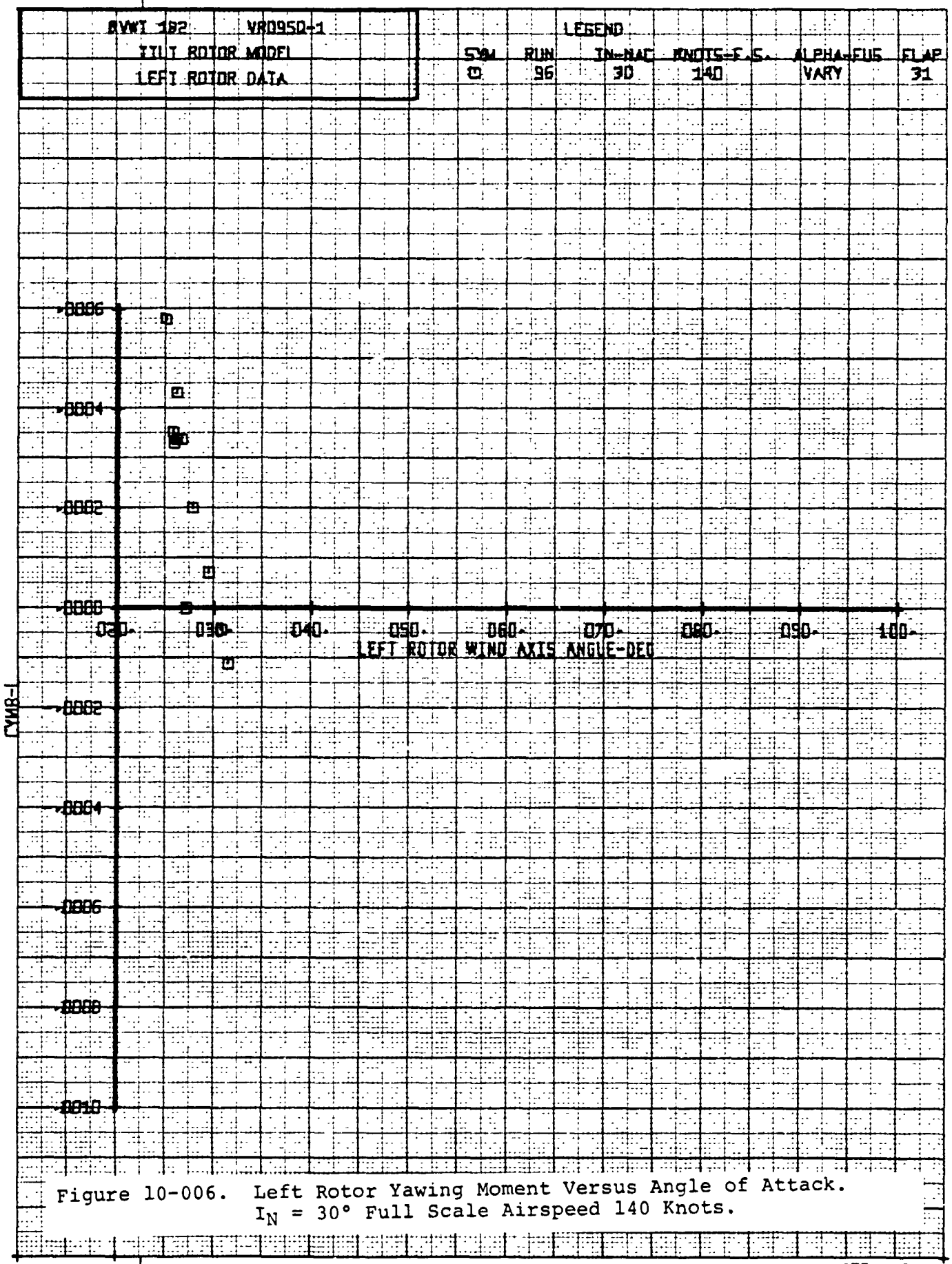
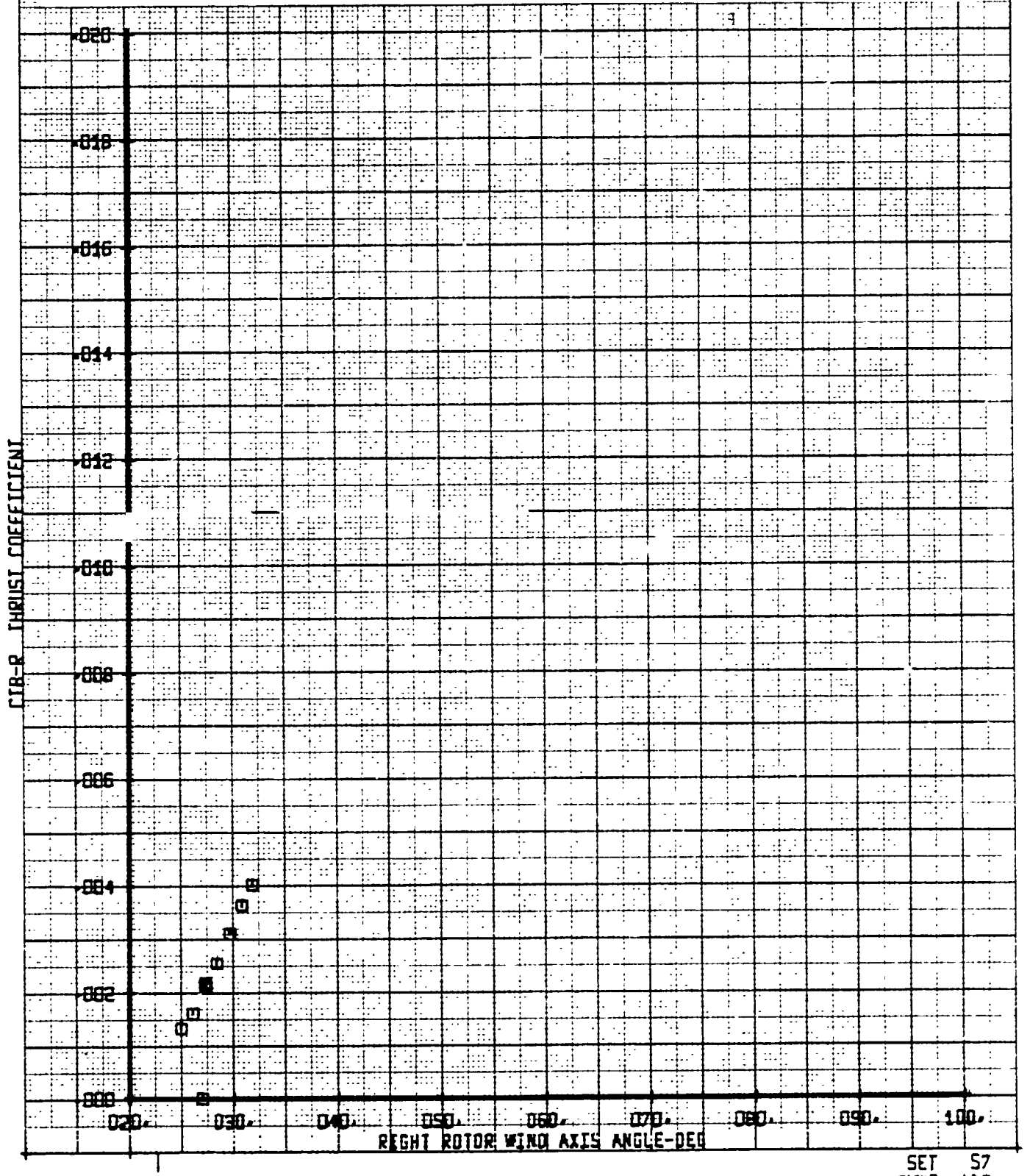


Figure 10-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	RUN	IN-HAG	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	96	30	140	VARY	31

Figure 10-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.



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BVWT 182

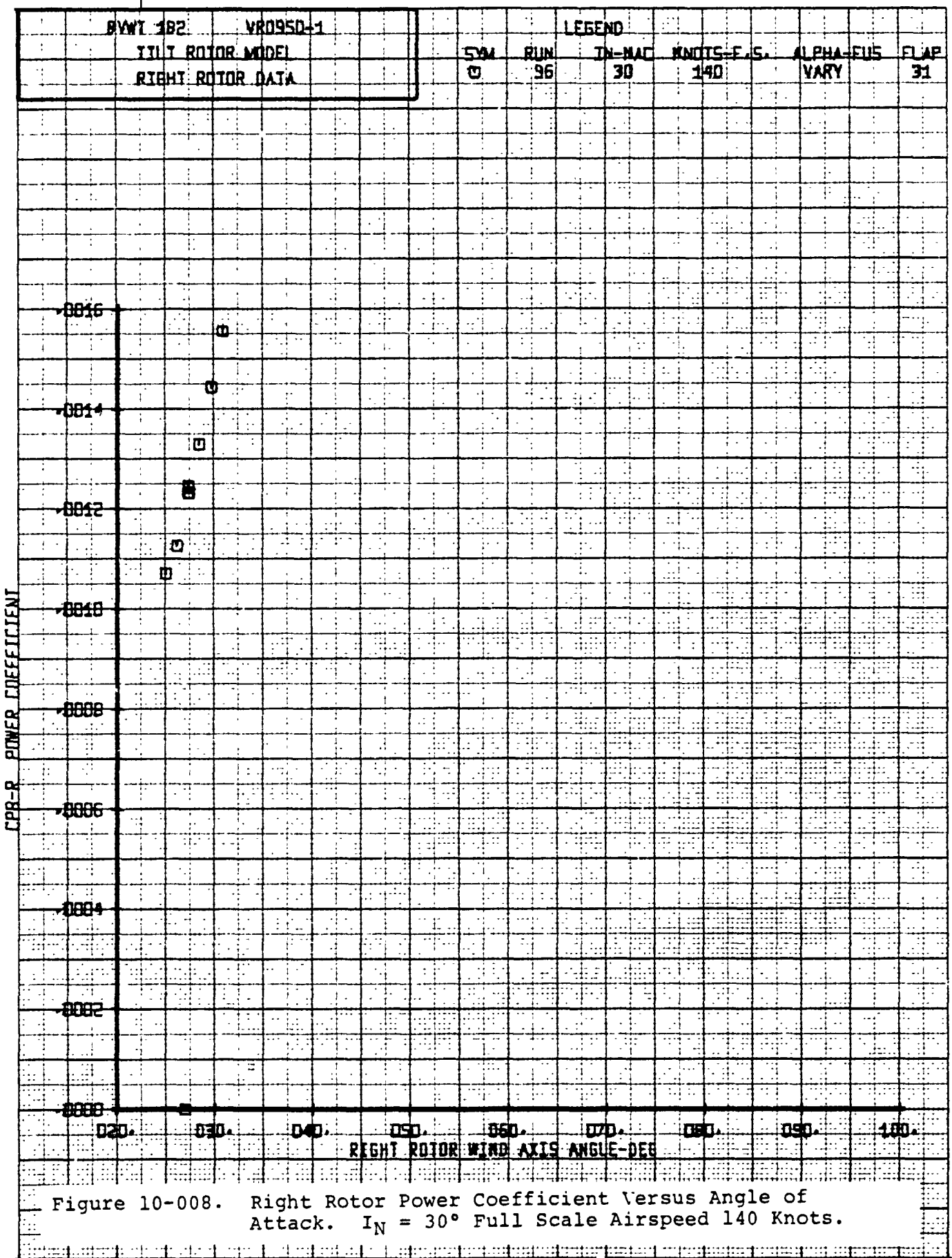

Figure 10-008. Right Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

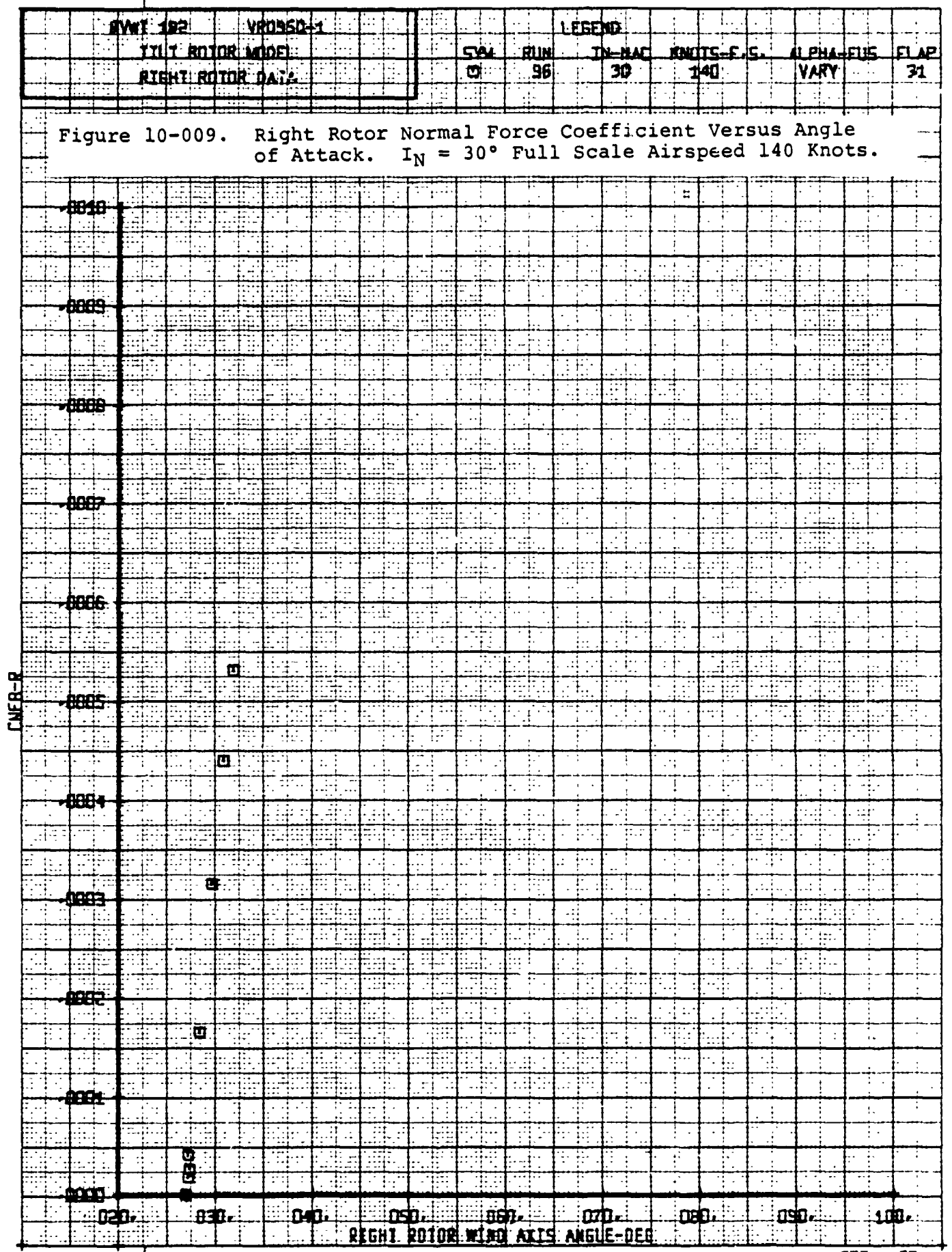

Figure 10-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

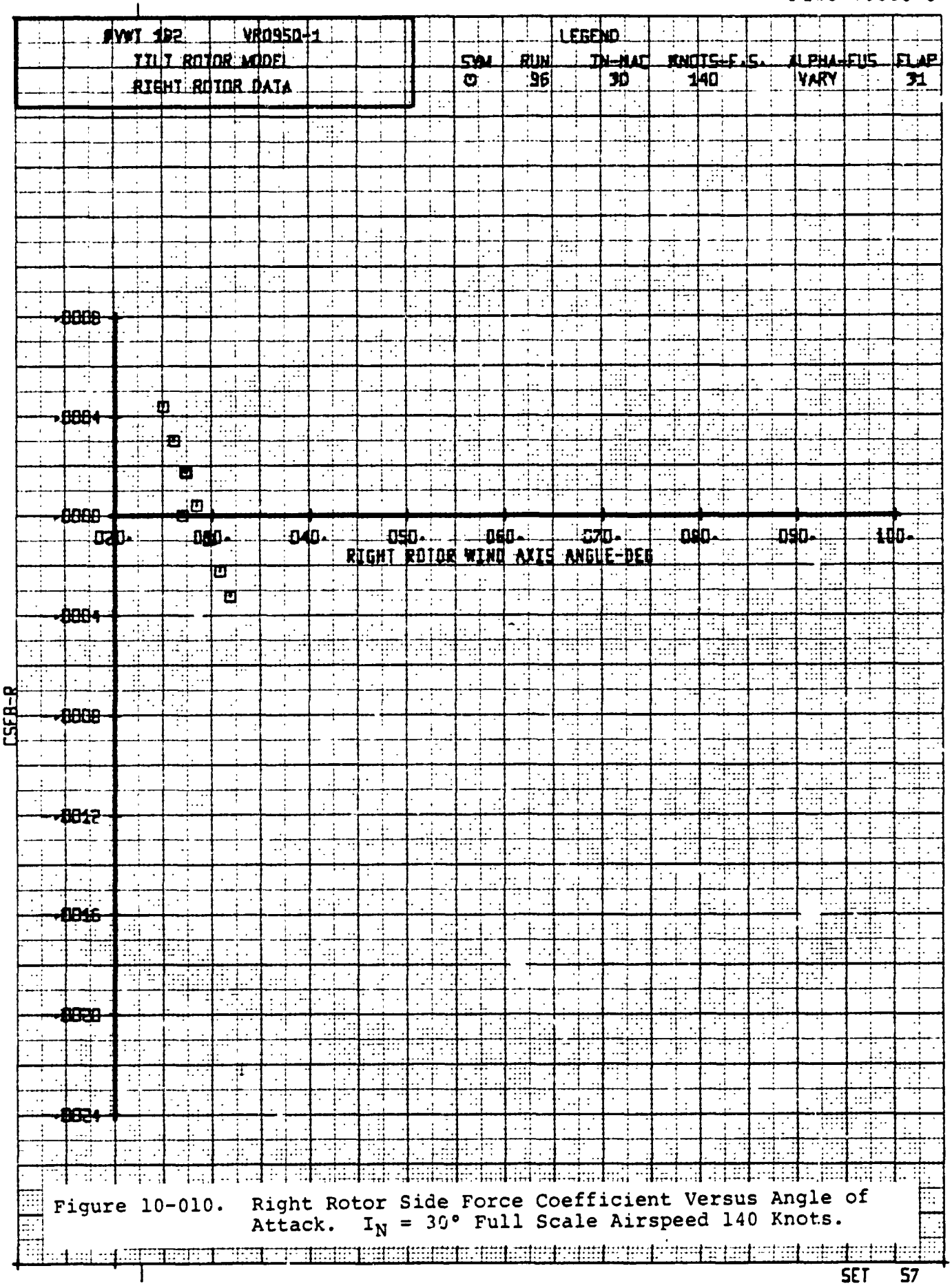

Figure 10-010. Right Rotor Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

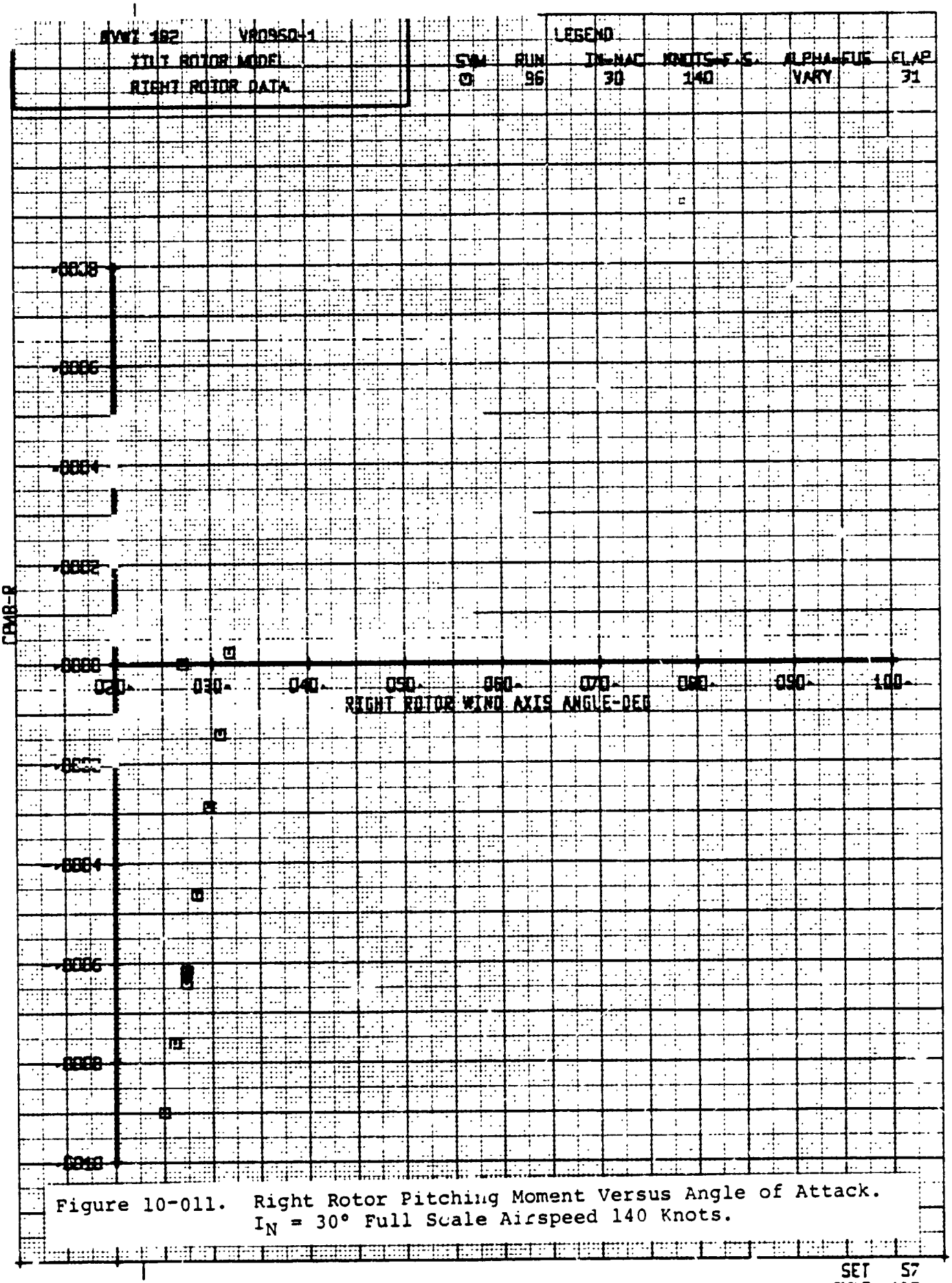

Figure 10-011. Right Rotor Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

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182

SET S7
BVWT 182

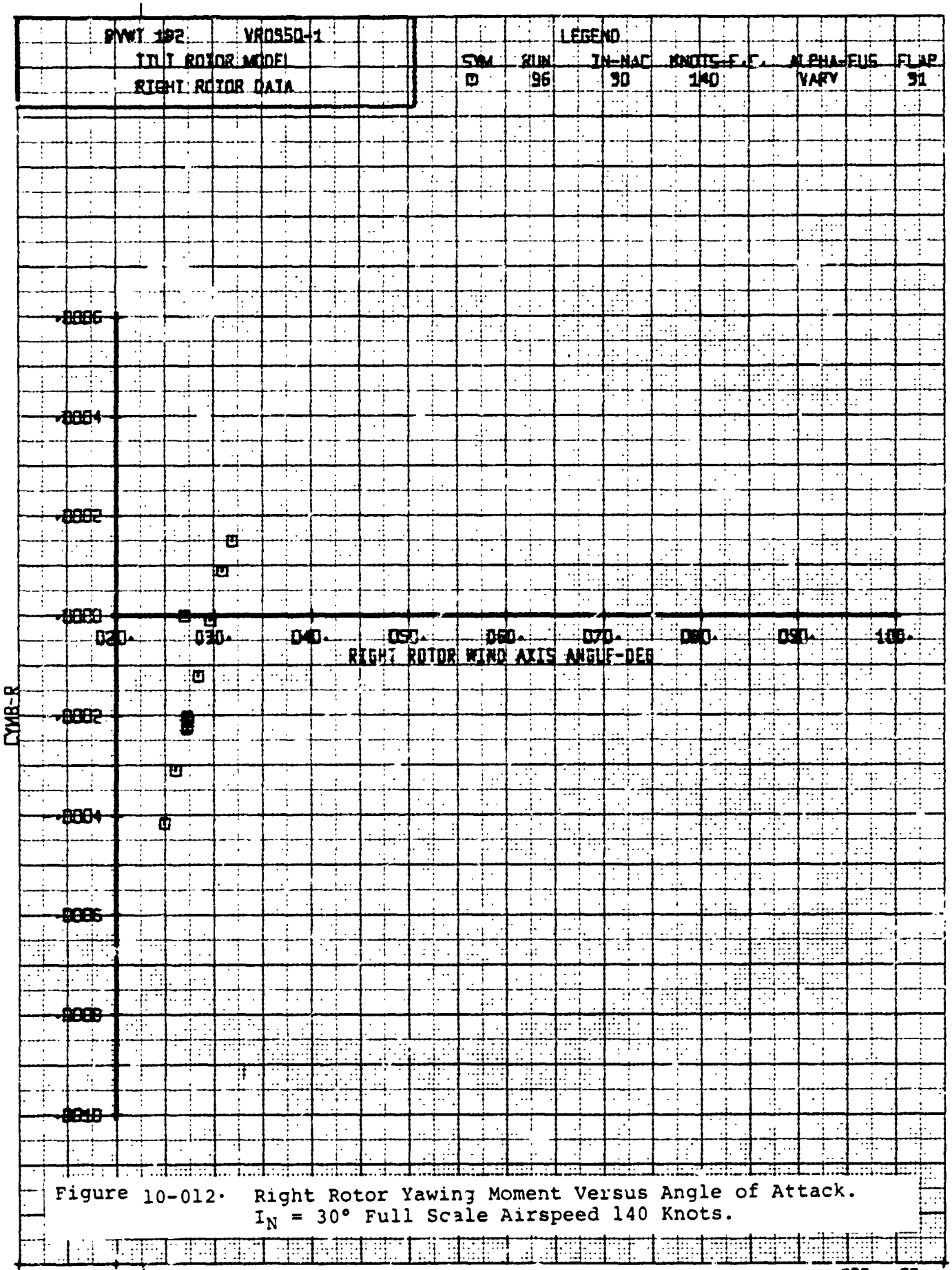

Figure 10-012. Right Rotor Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

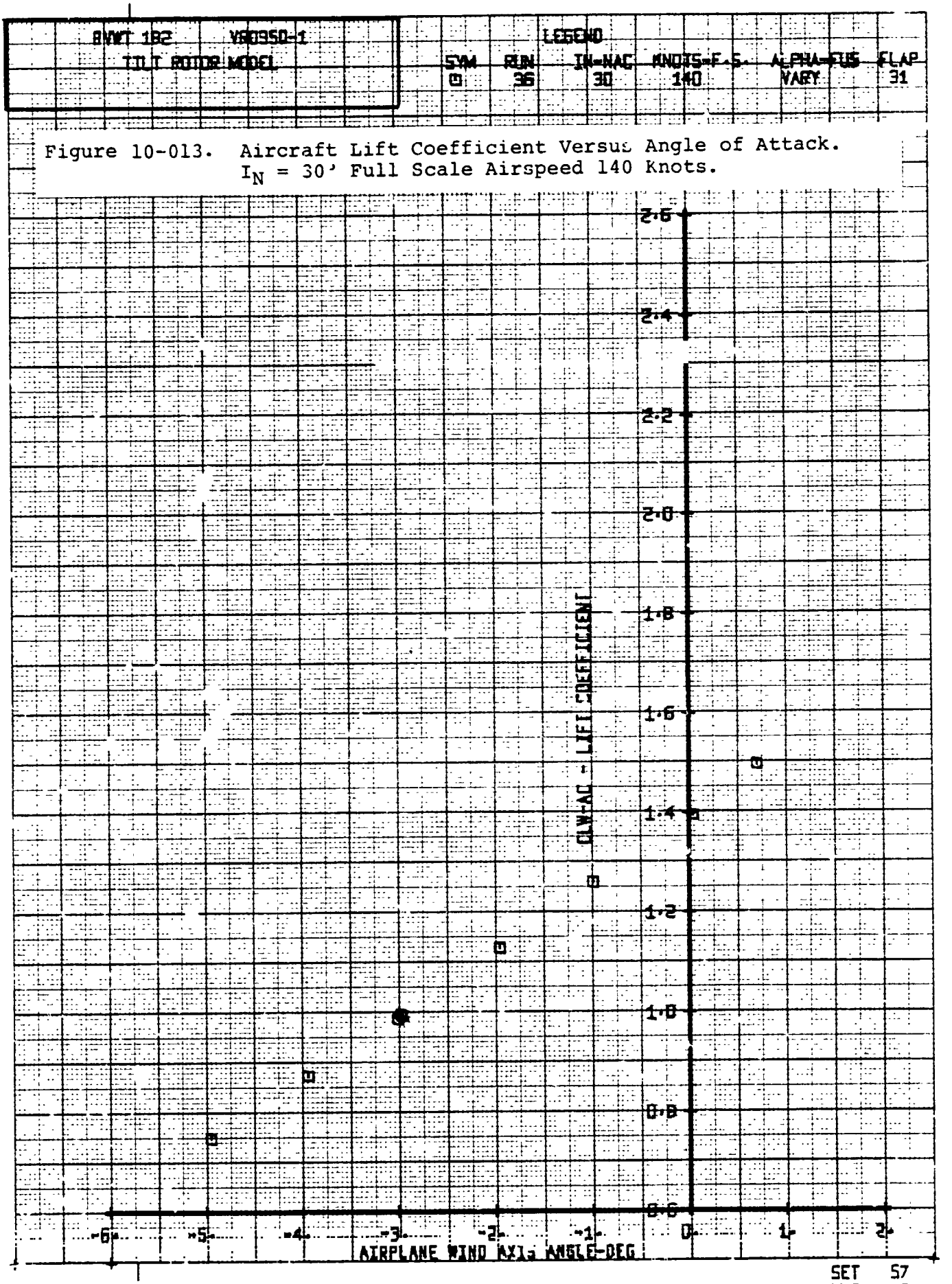

Figure 10-013. Aircraft Lift Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

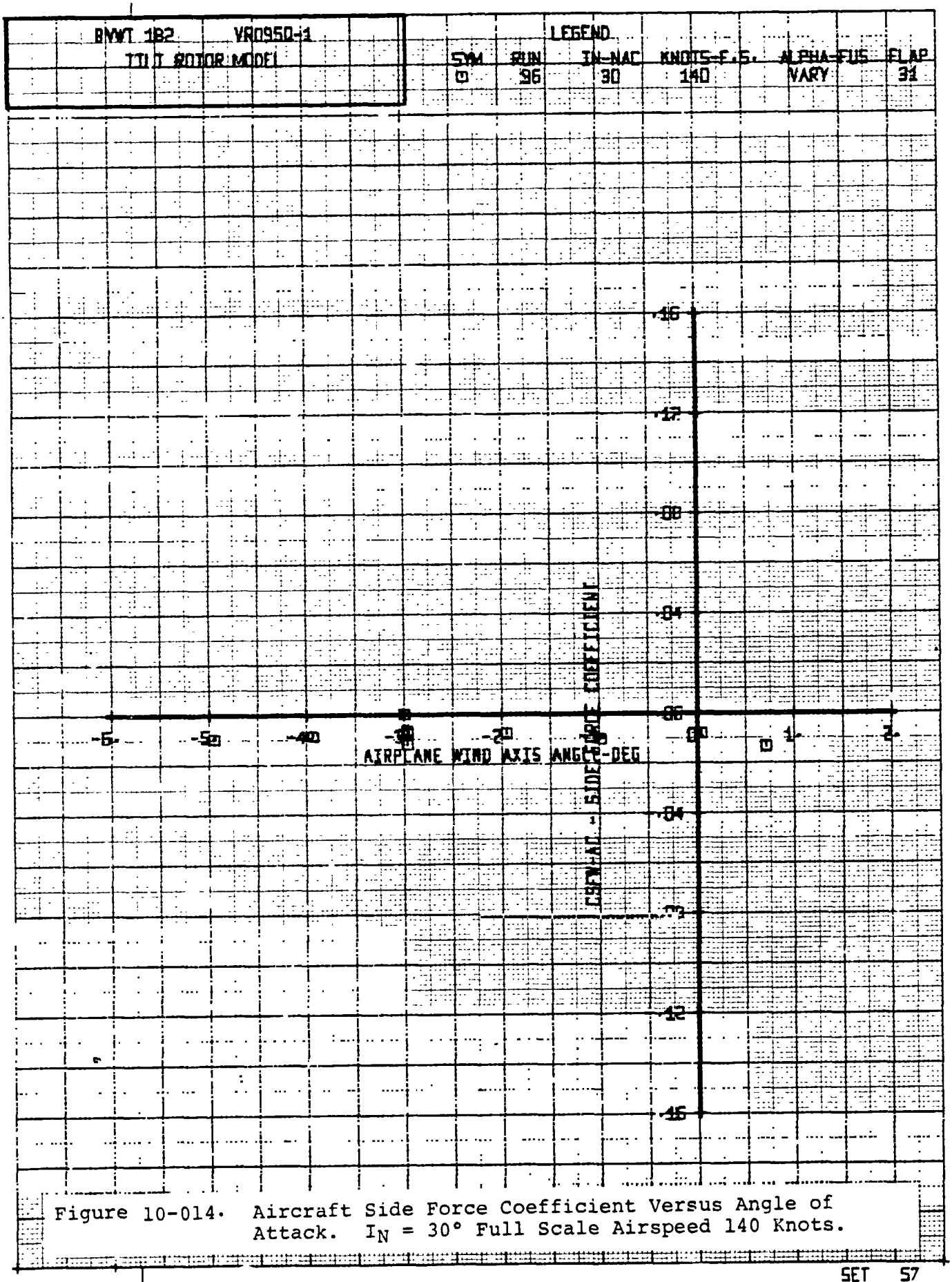

Figure 10-014. Aircraft Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

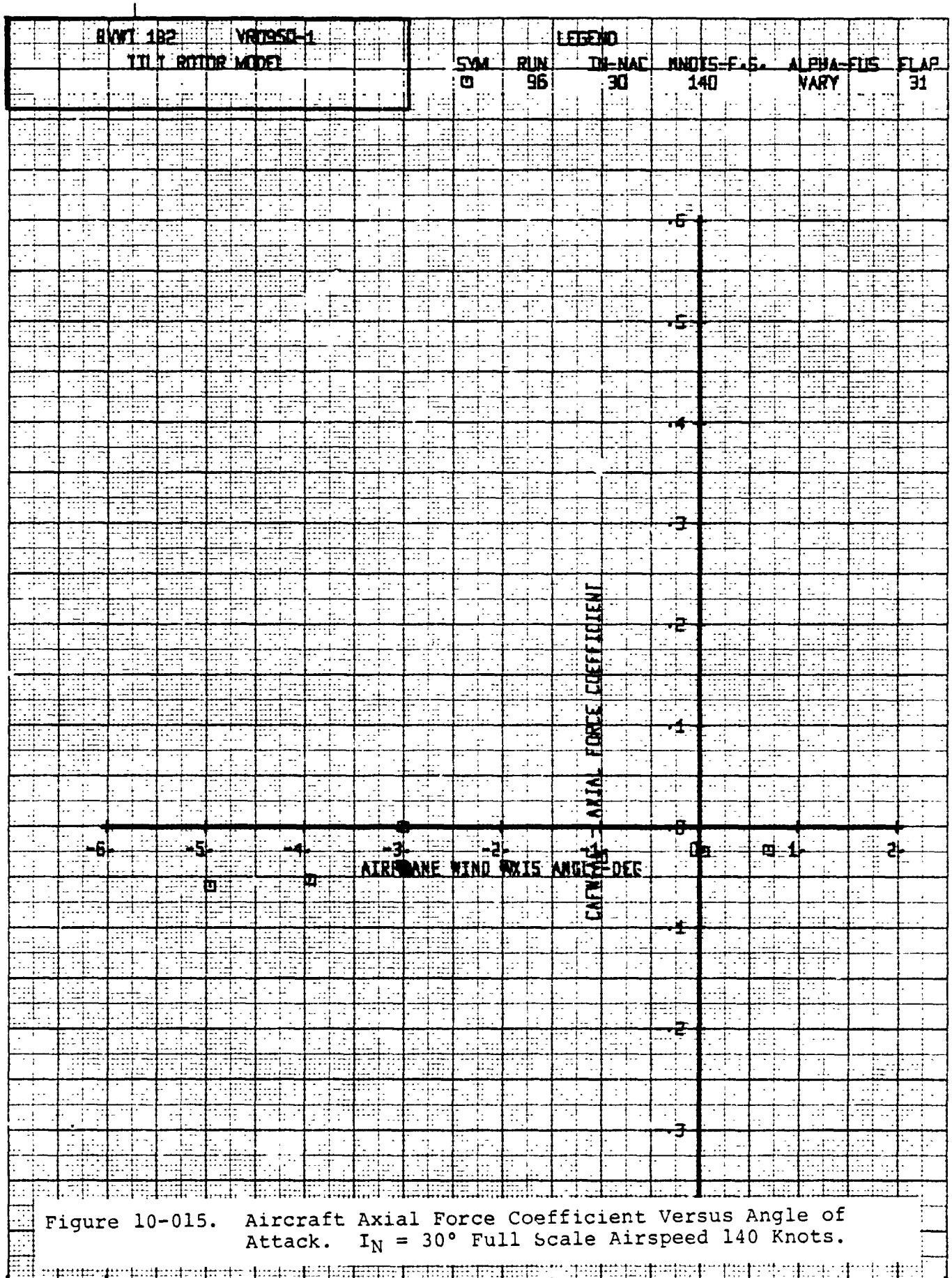

Figure 10-015. Aircraft Axial Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

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182

SET 57
BVWT 182

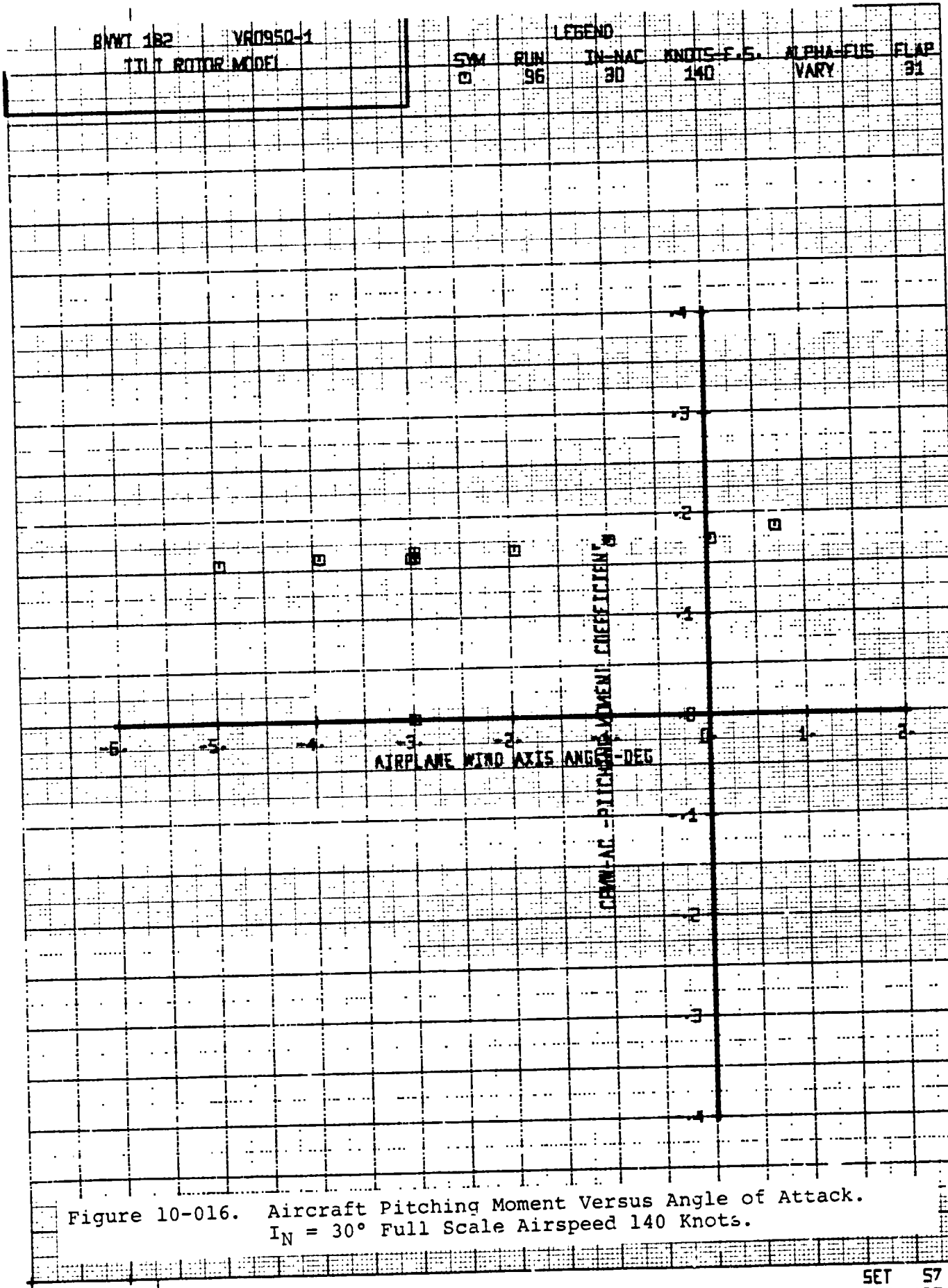


Figure 10-016. Aircraft Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

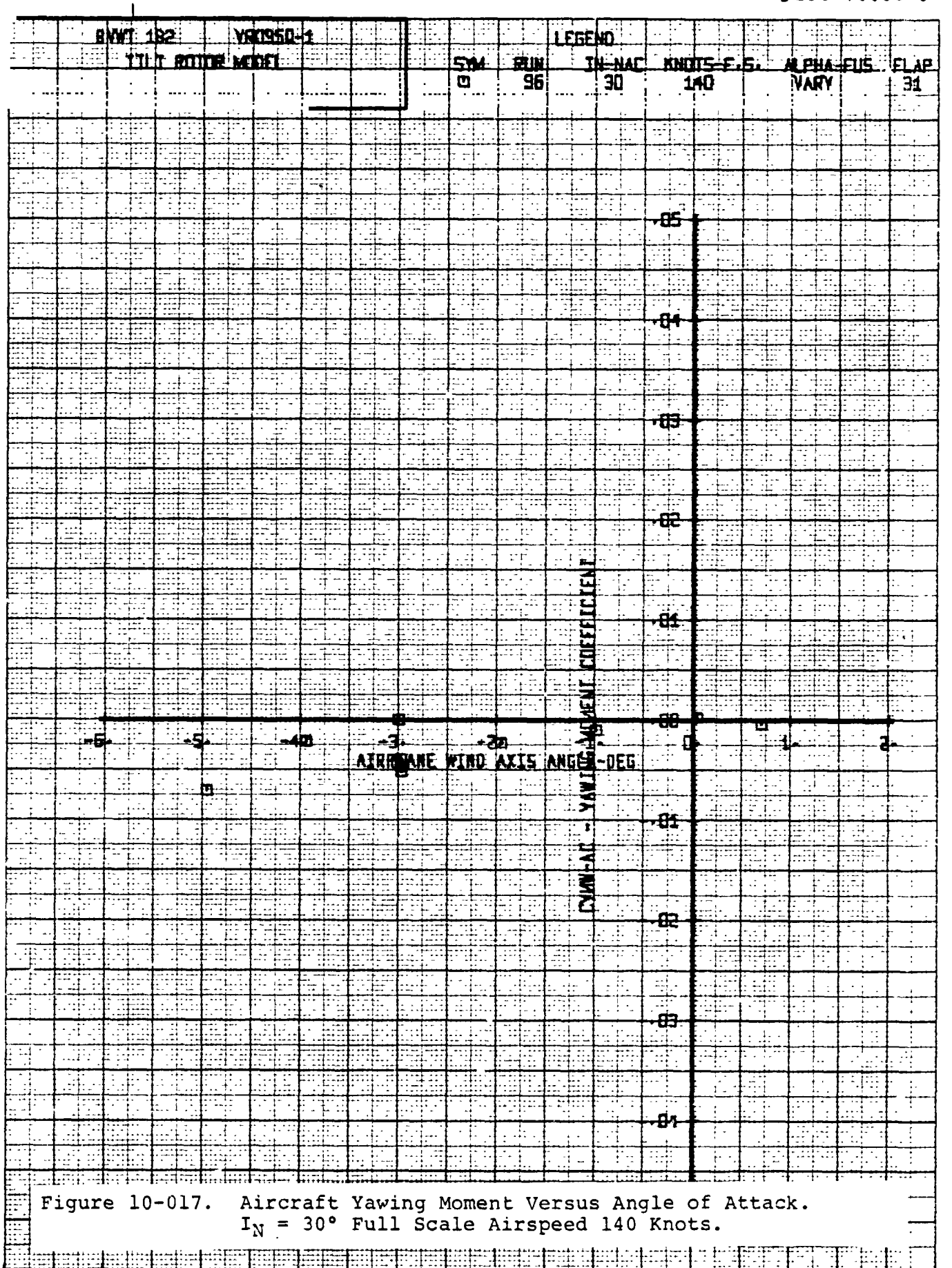


Figure 10-017. Aircraft Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

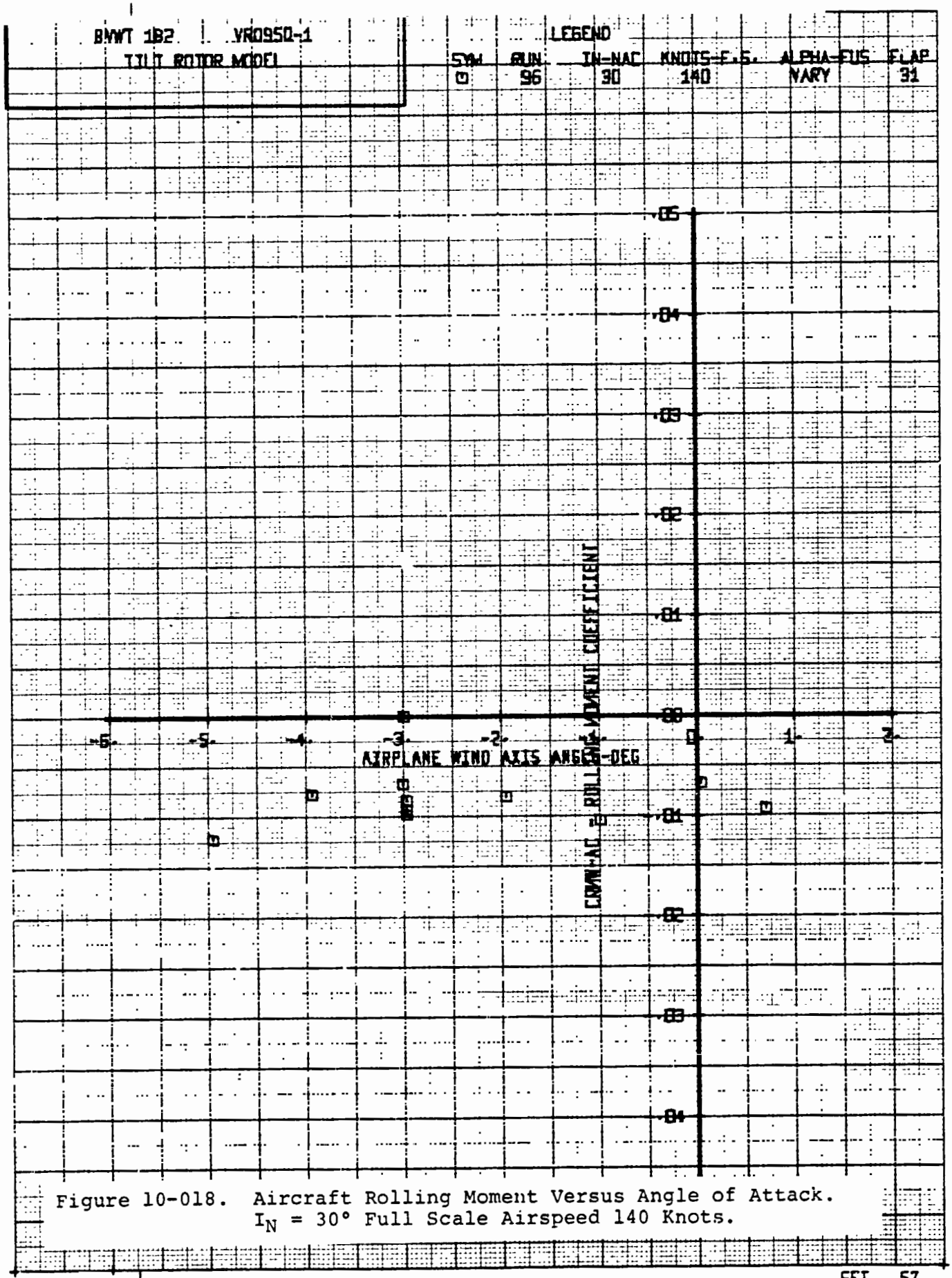


Figure 10-018. Aircraft Rolling Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

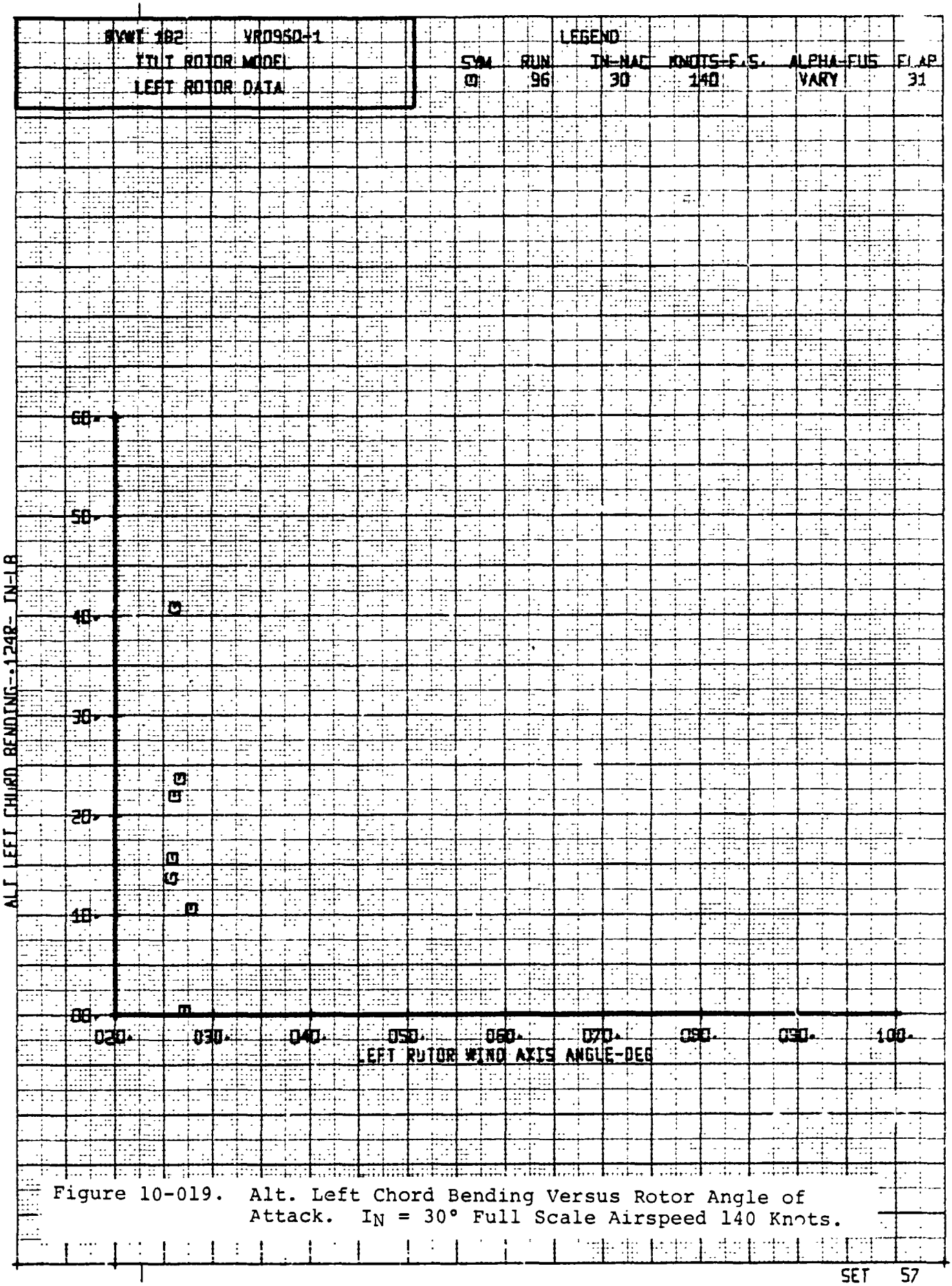


Figure 10-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

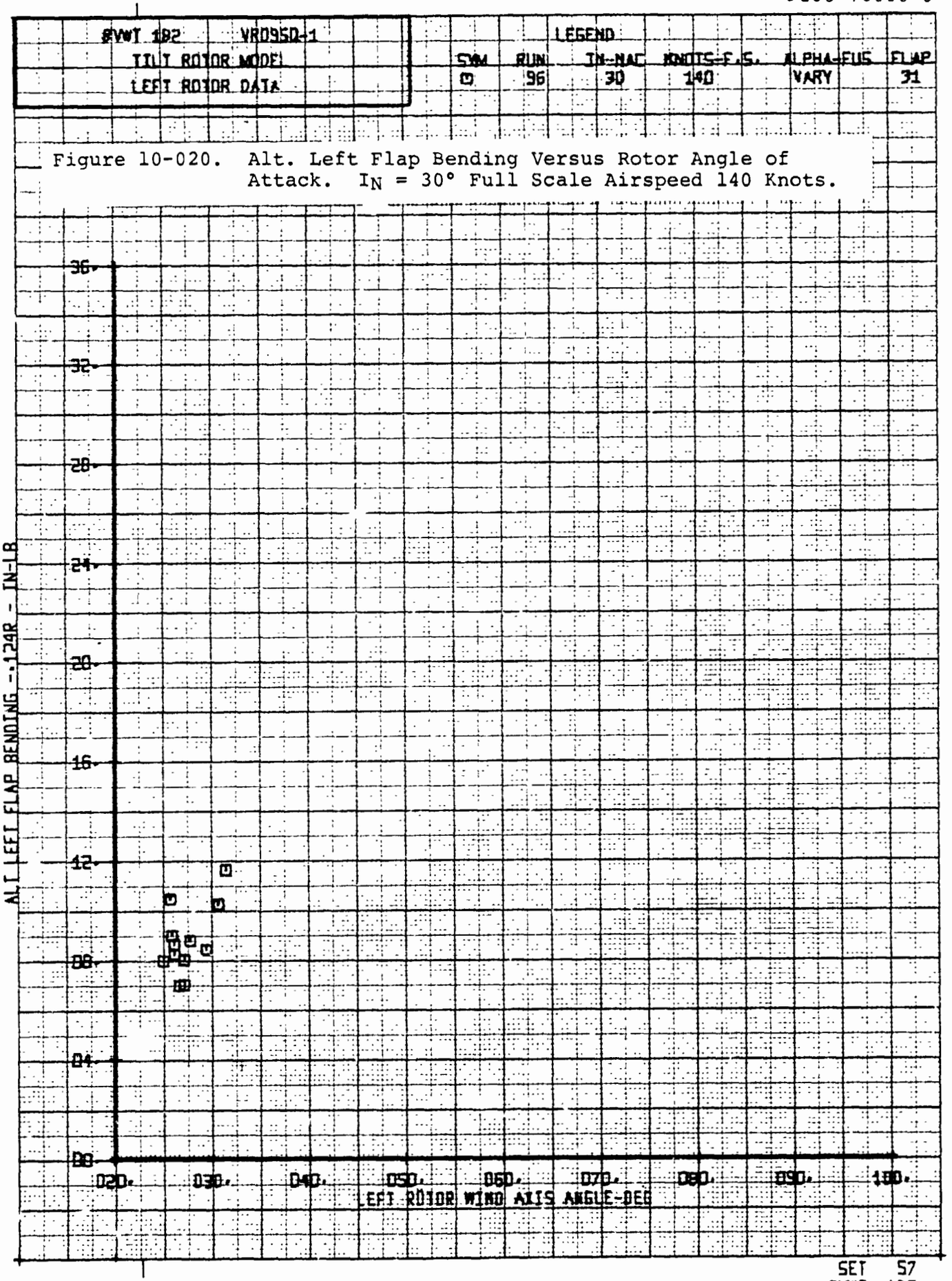


Figure 10-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

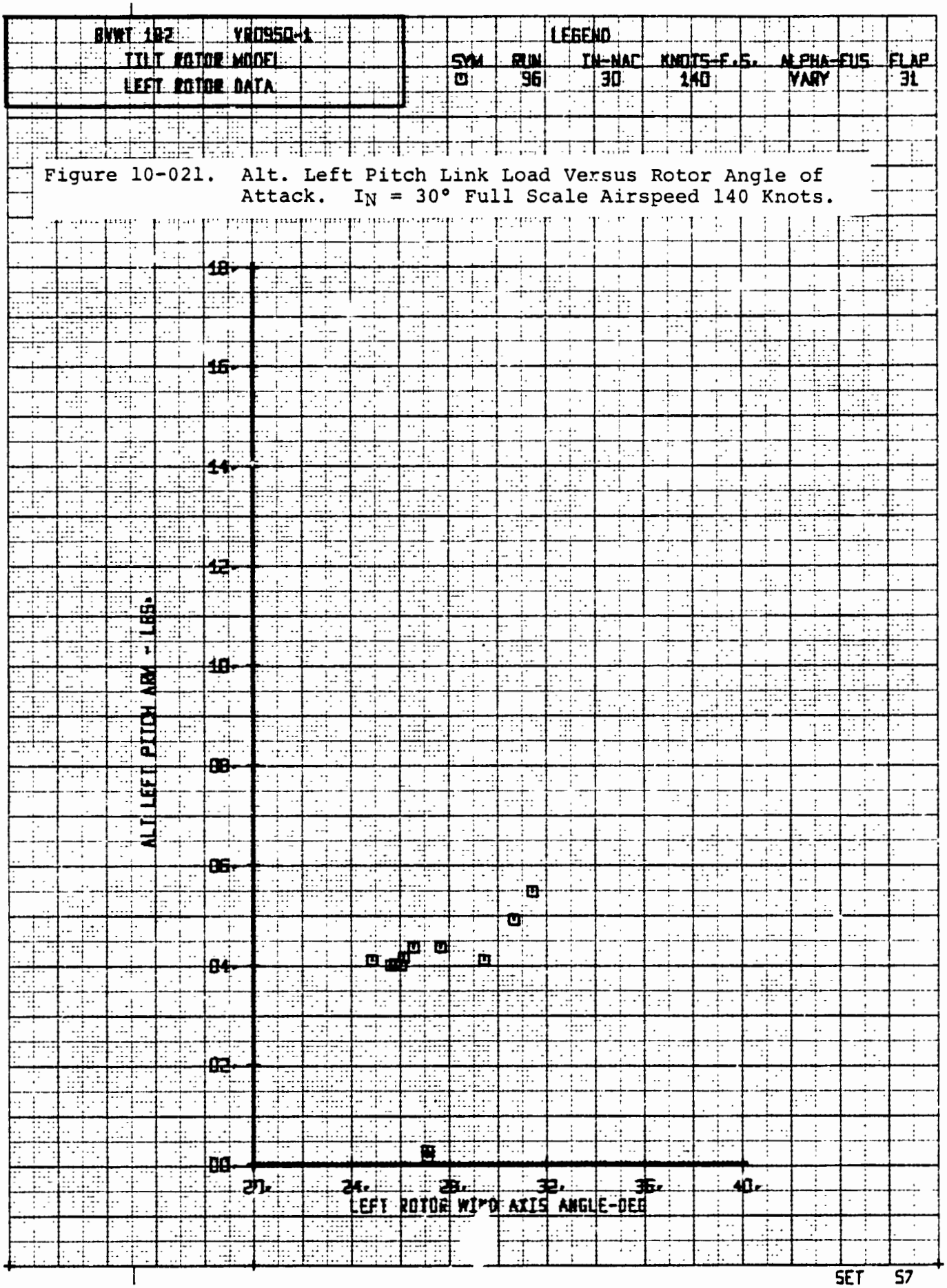


Figure 10-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

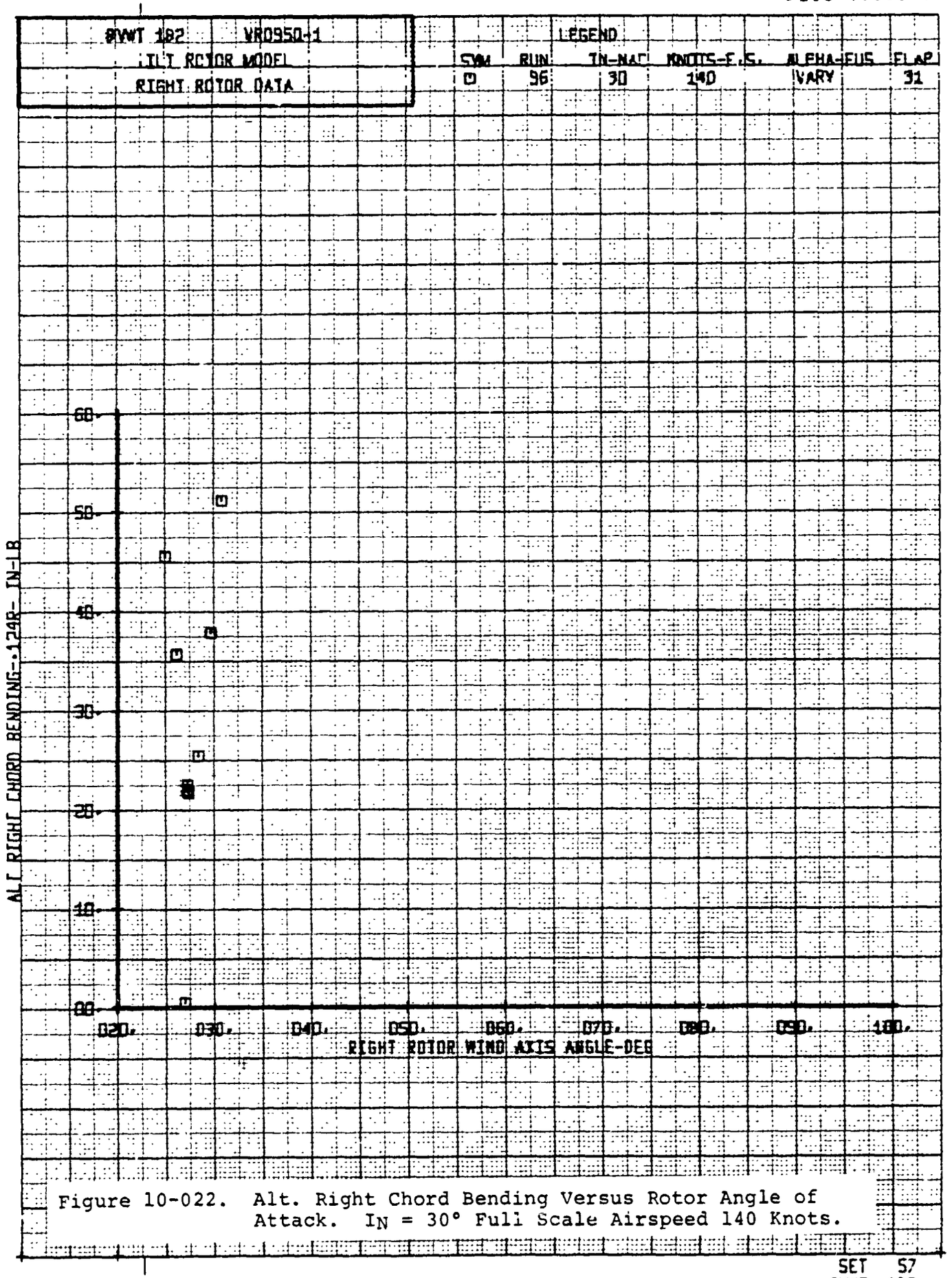


Figure 10-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

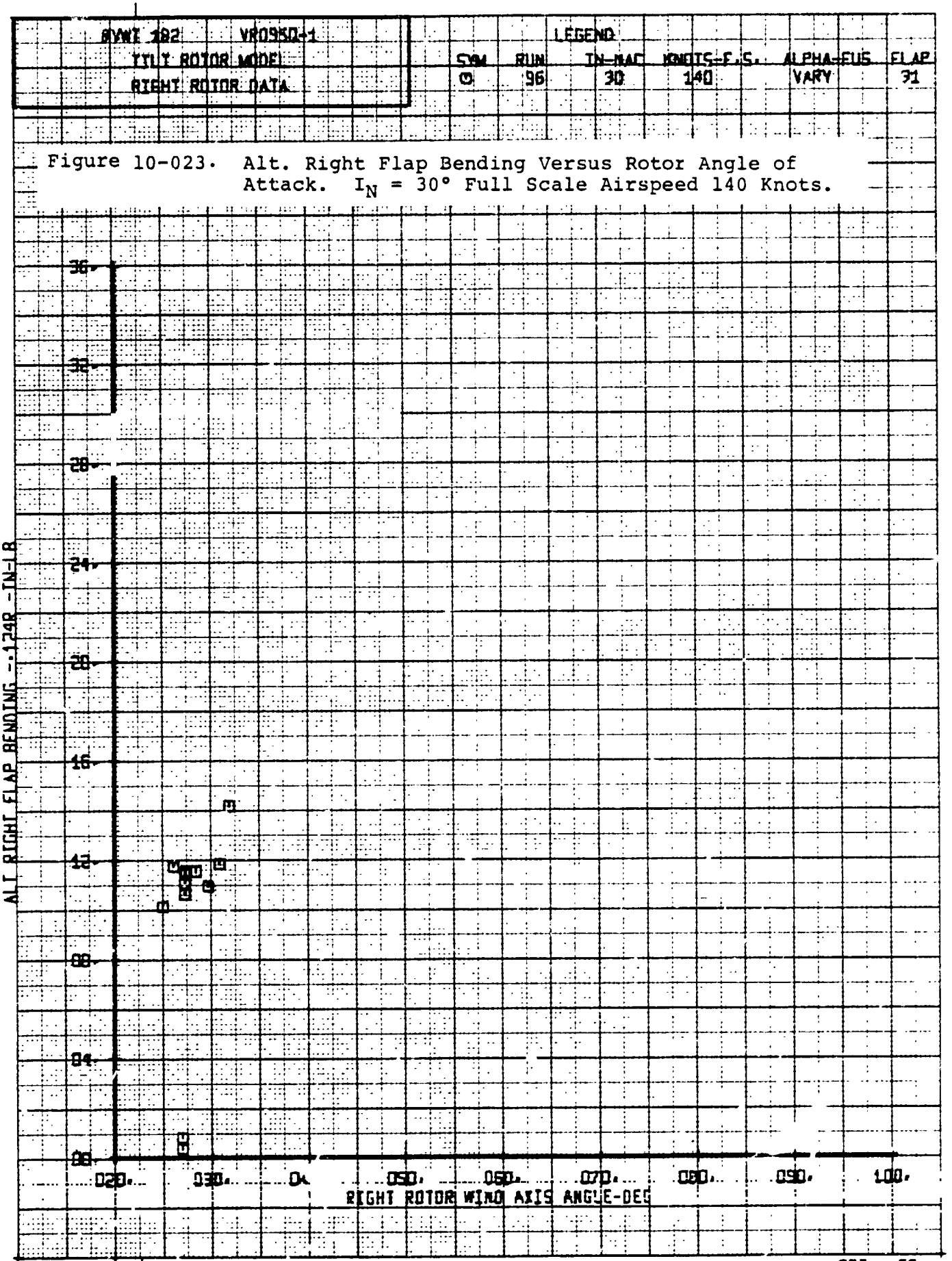
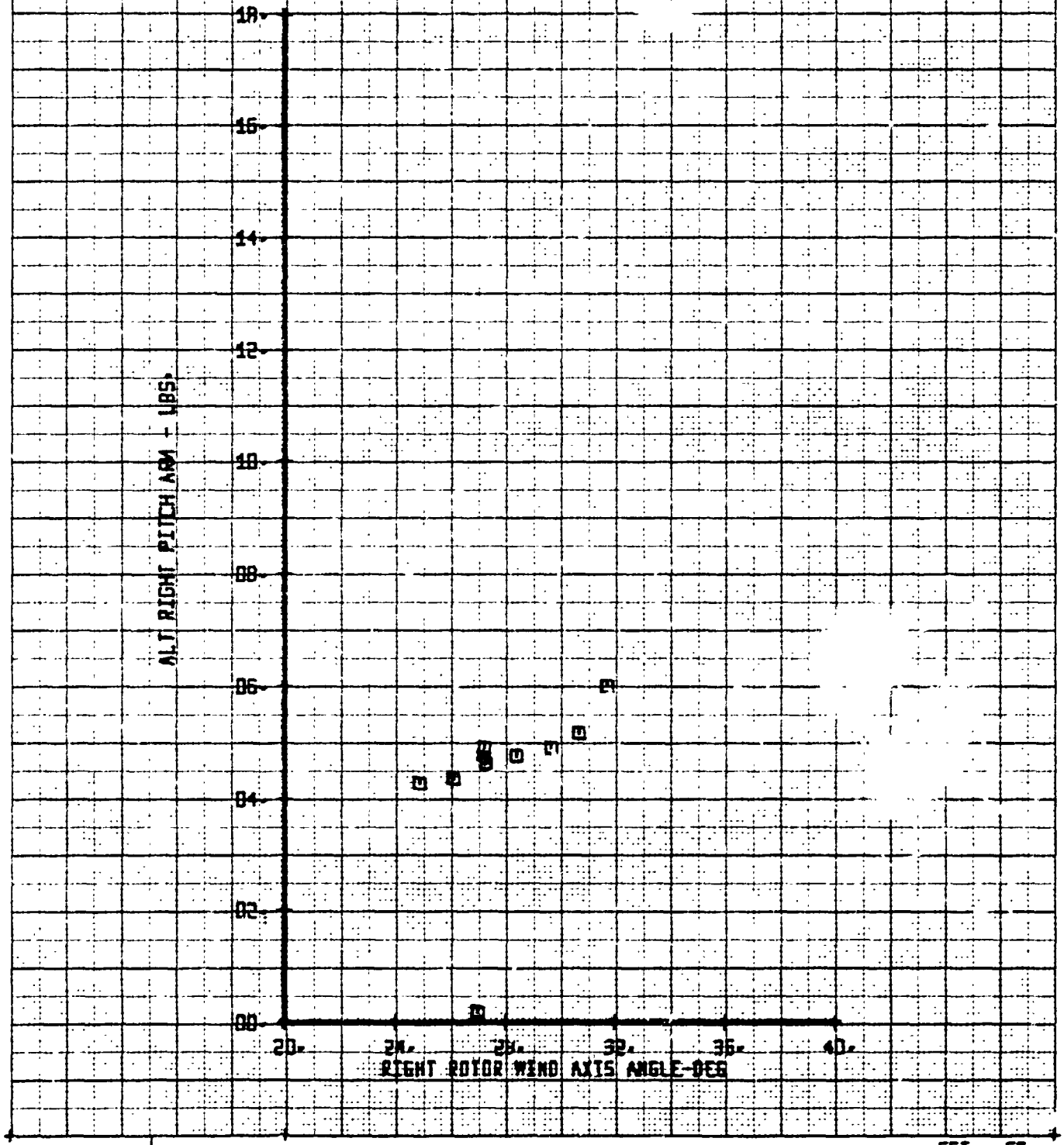


Figure 10-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 YRCBSQ-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	96	30	140	VARY	31

Figure 10-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 140 Knots.



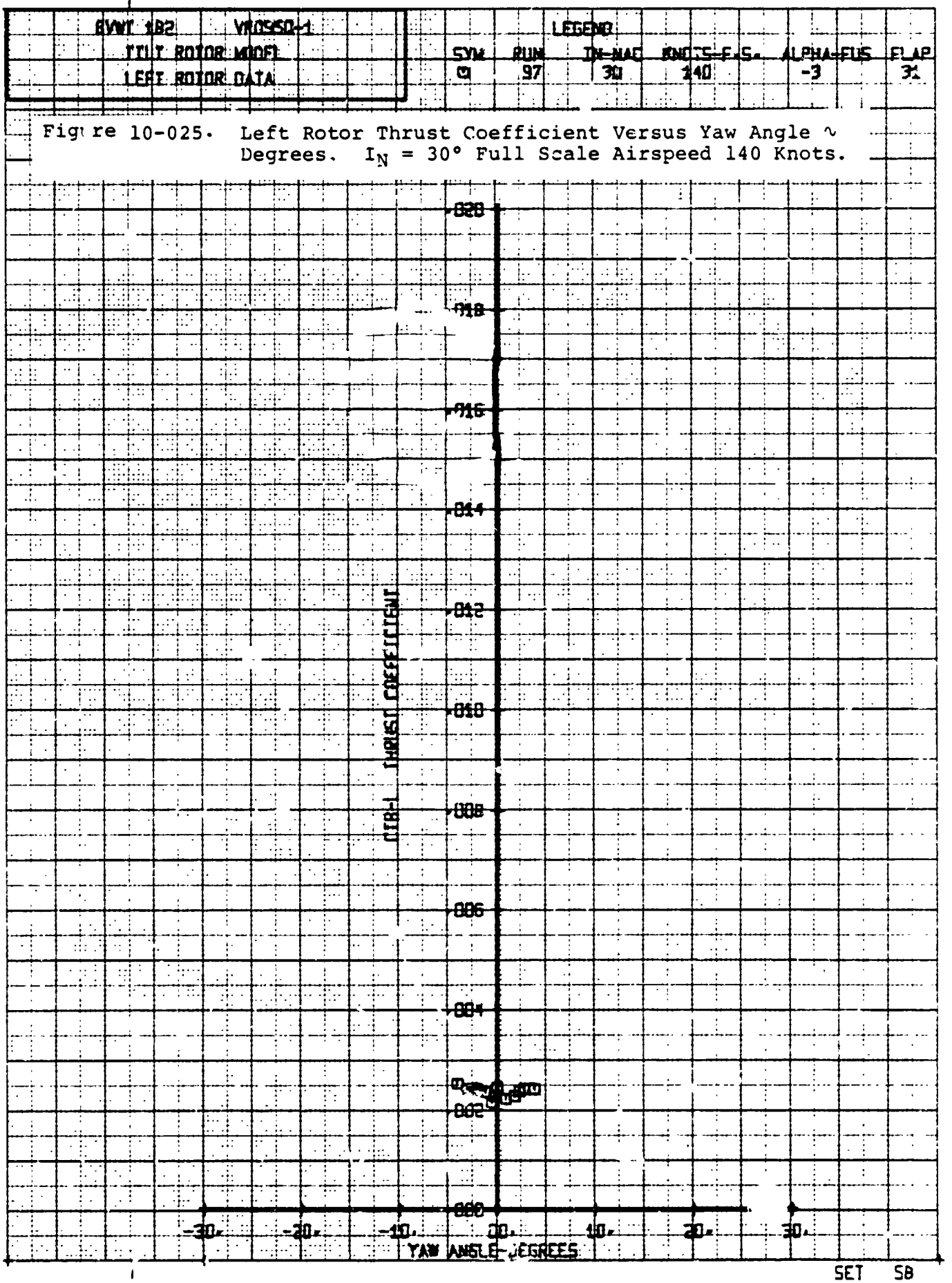


Figure 10-025. Left Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

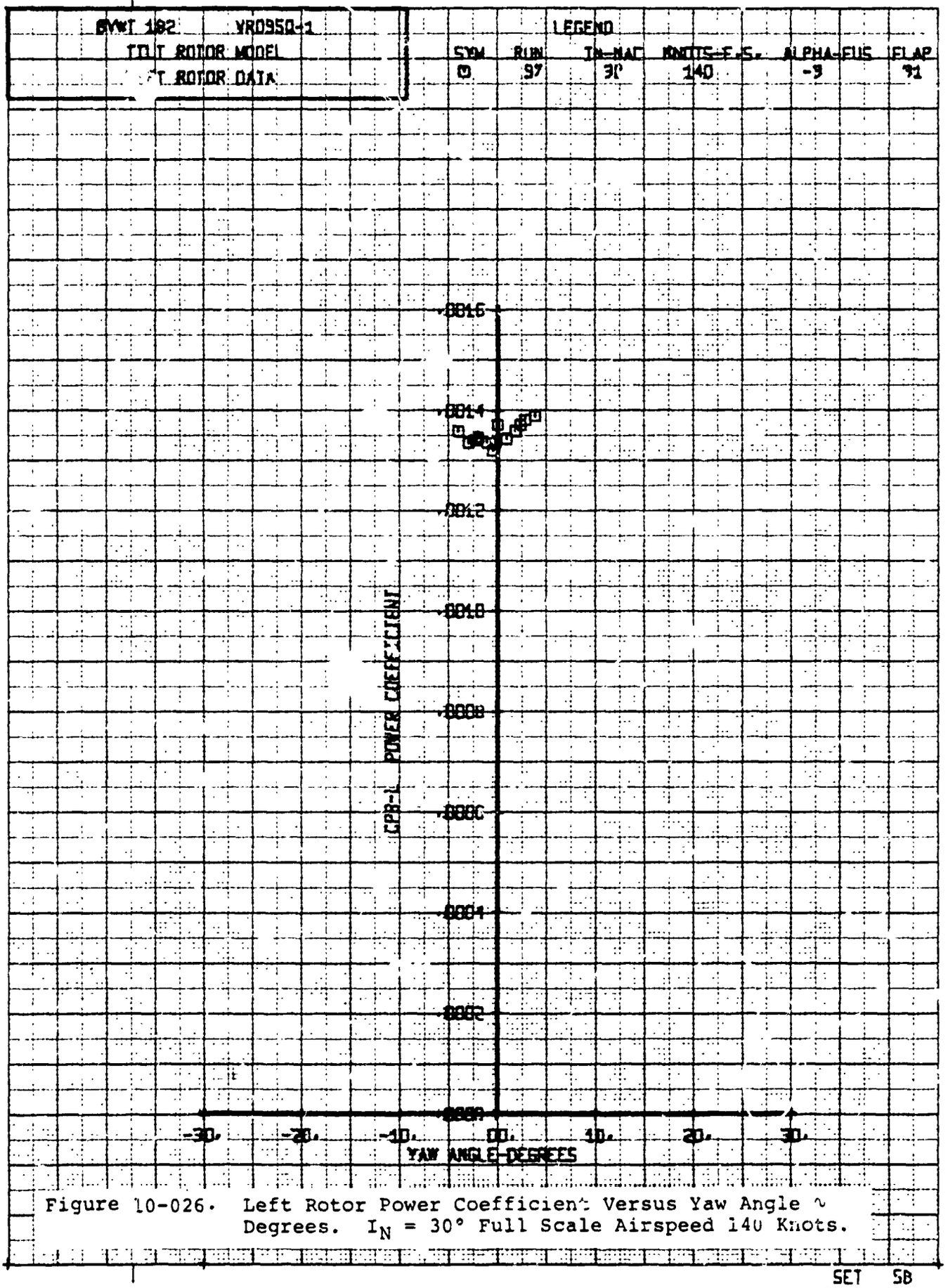


Figure 10-026. Left Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

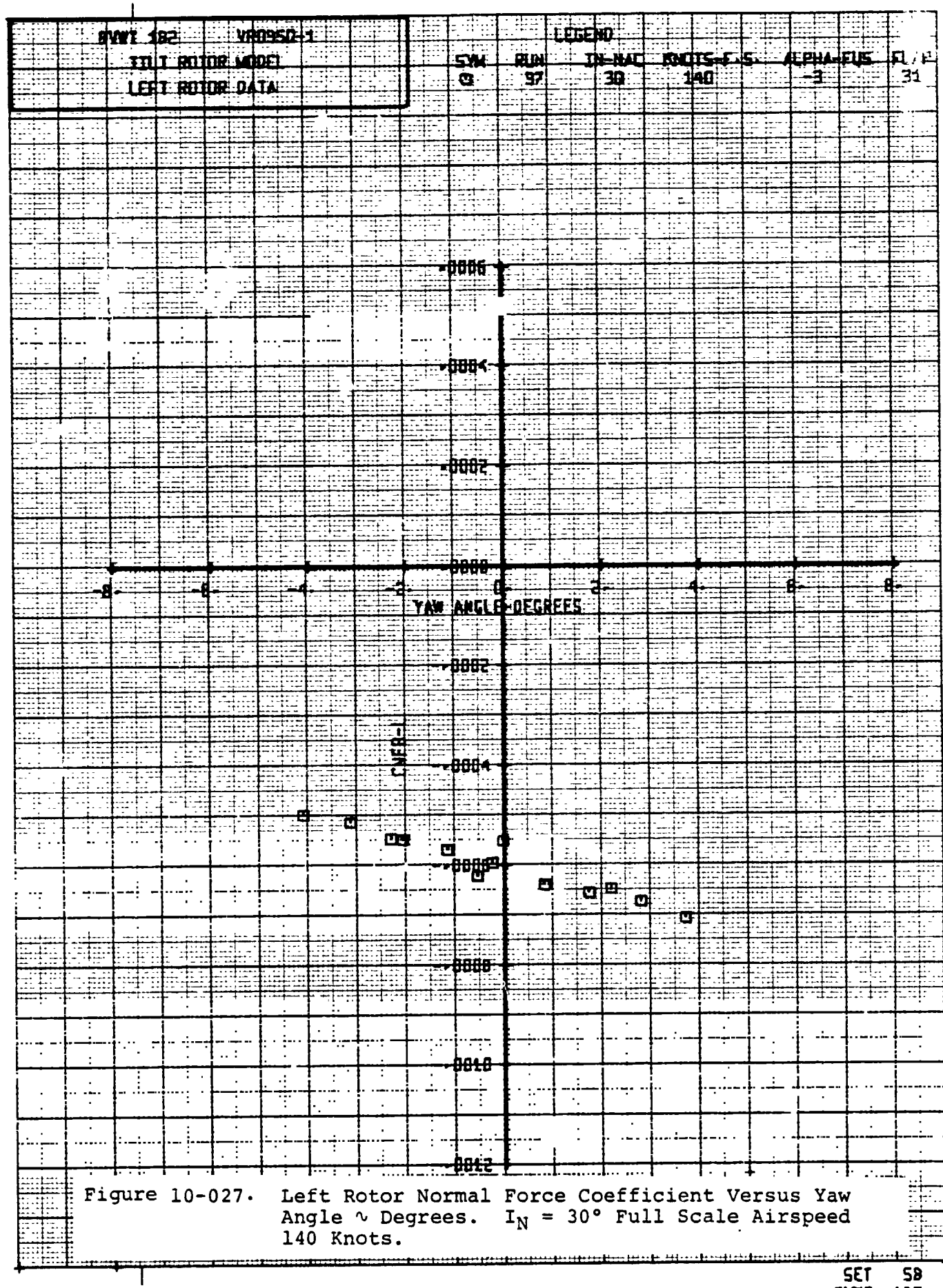


Figure 10-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

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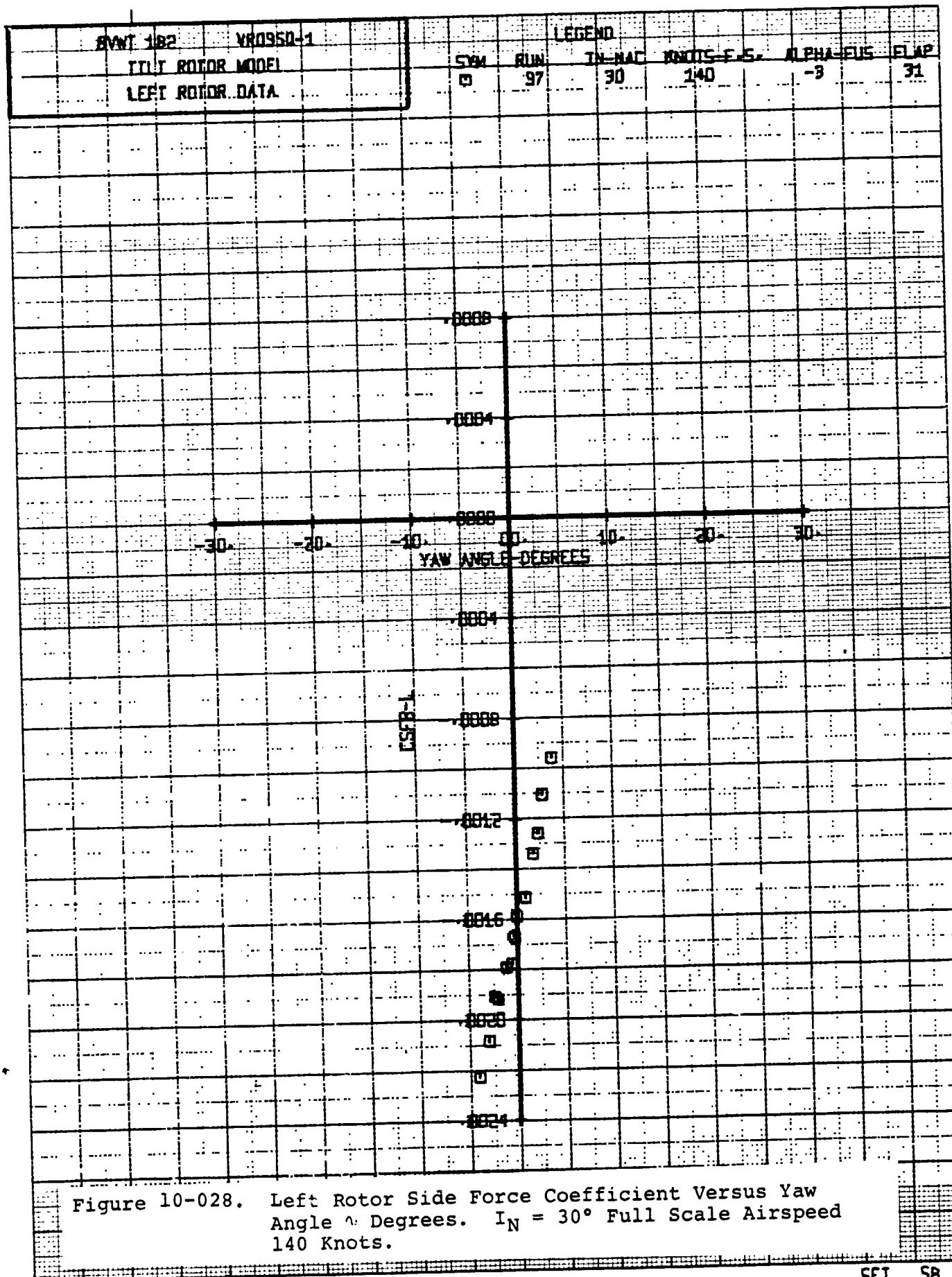


Figure 10-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

SET SB
BVWT 182

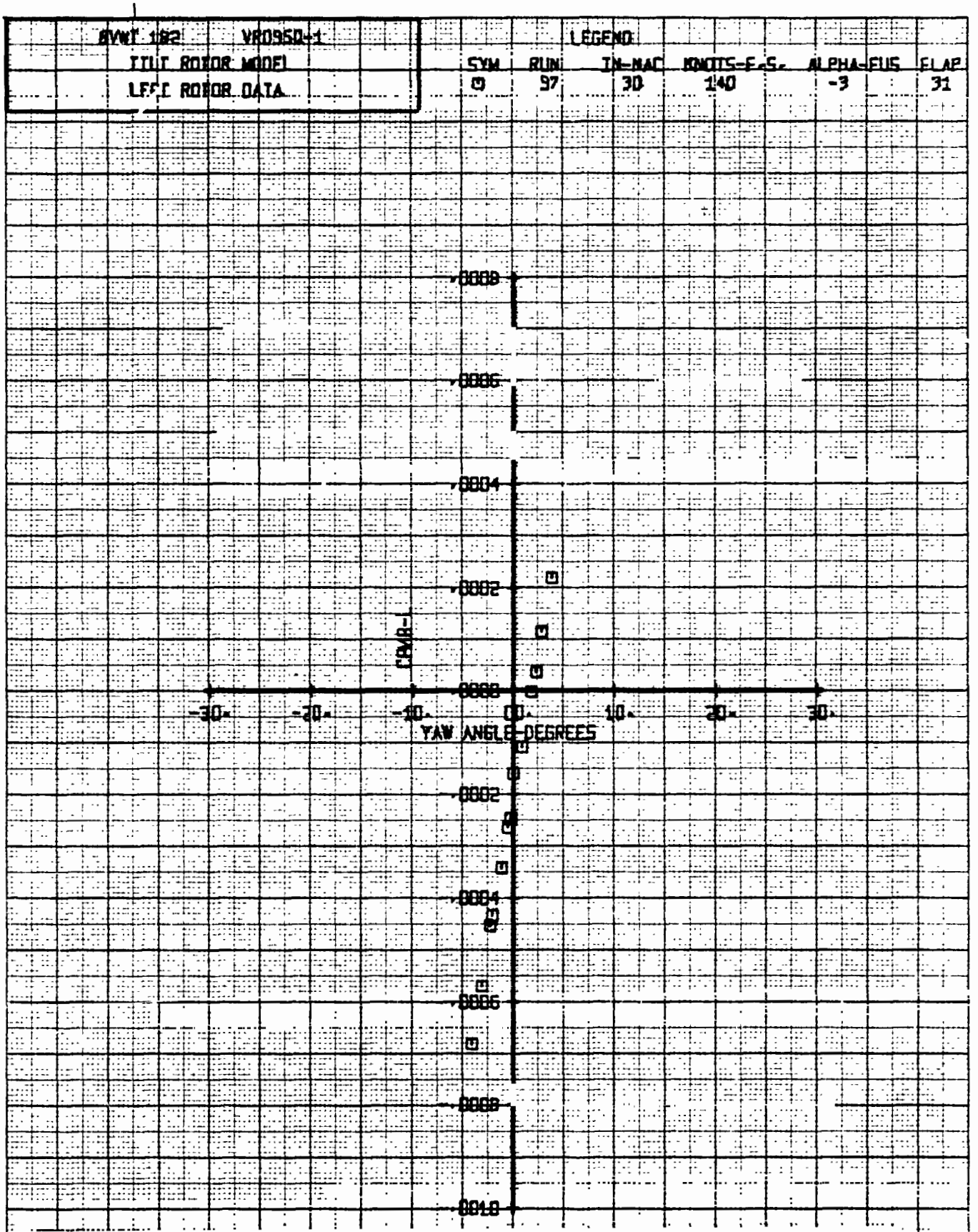


Figure 10-029. Left Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

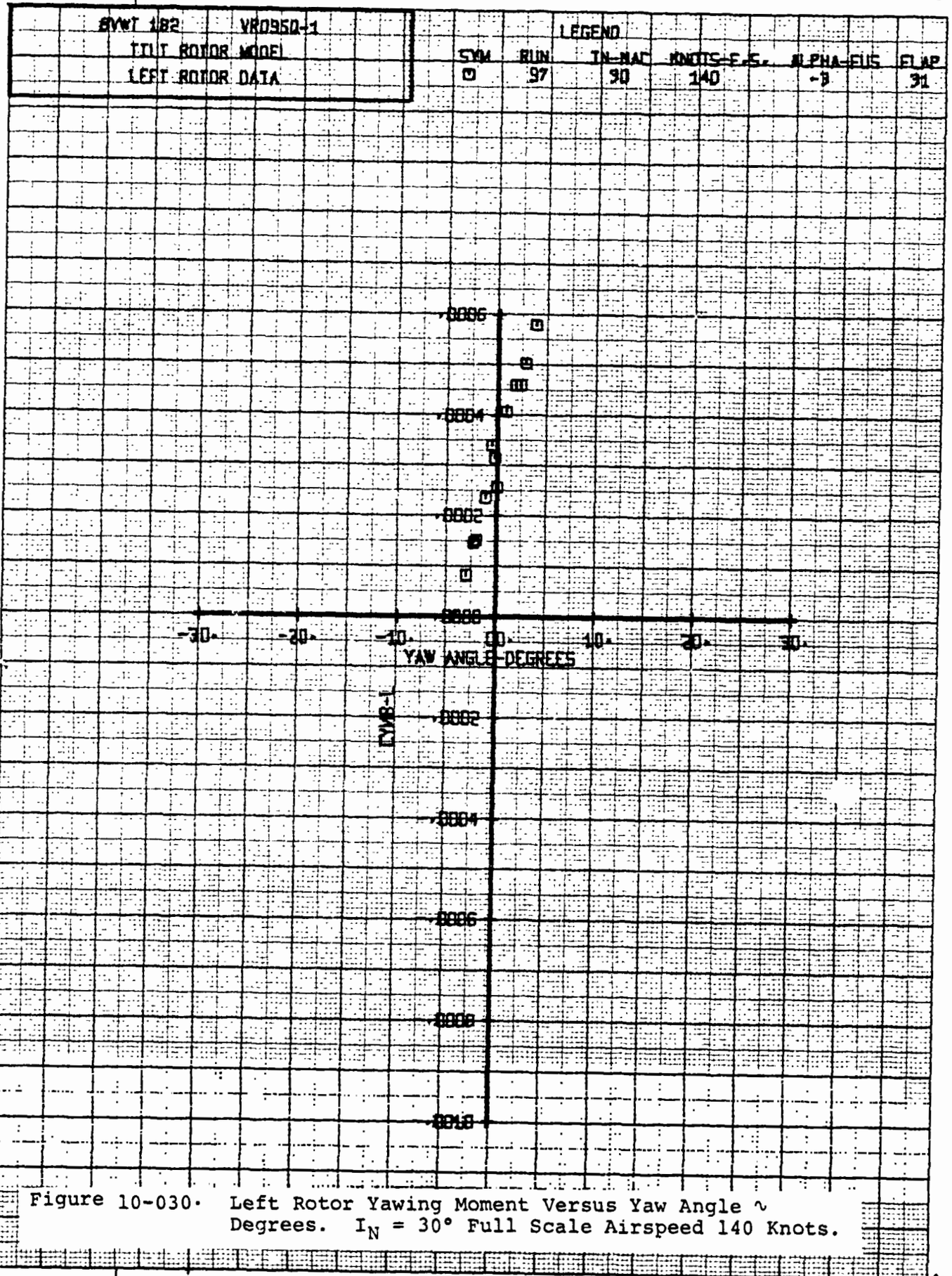


Figure 10-030. Left Rotor Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

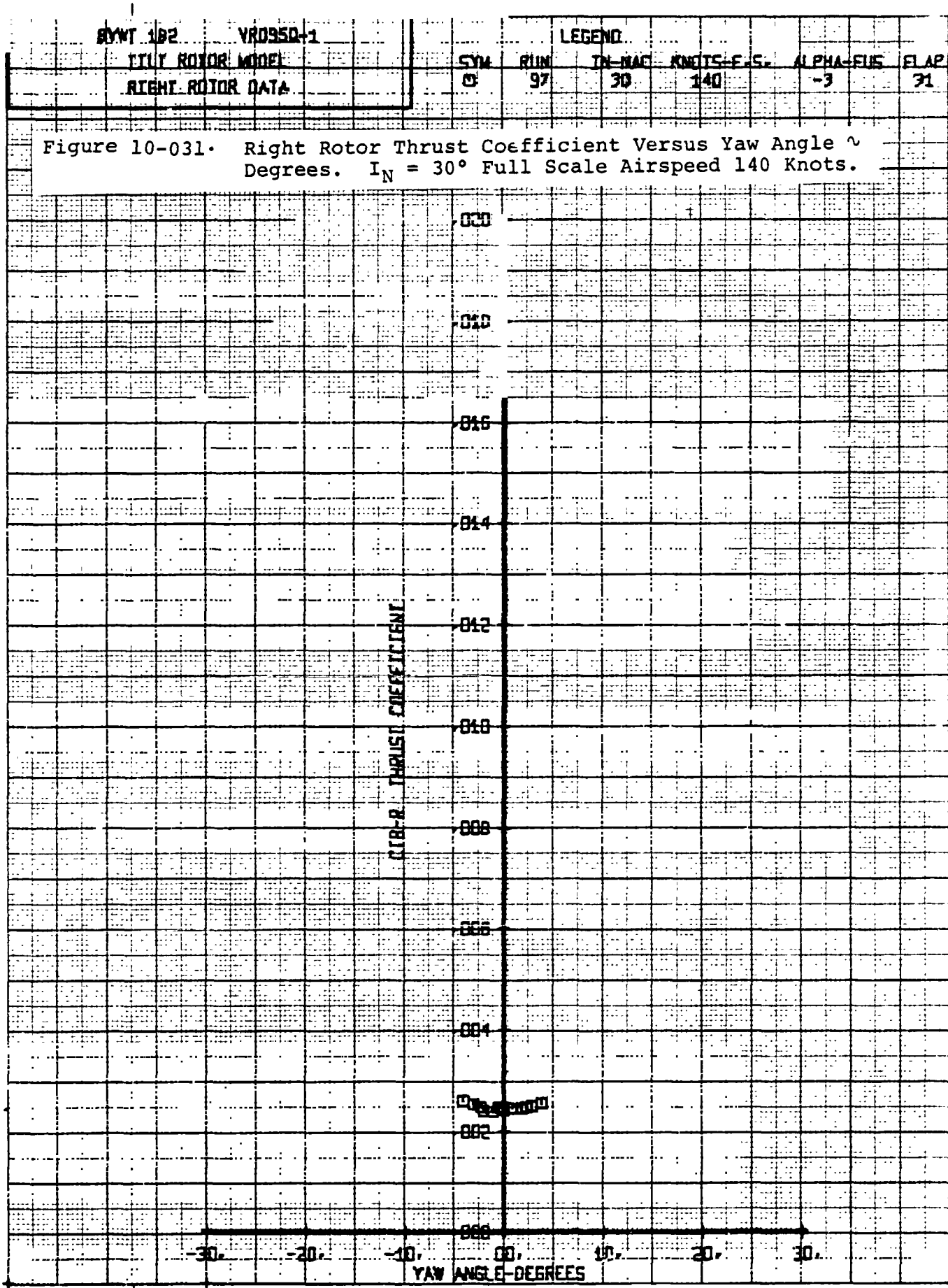


Figure 10-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

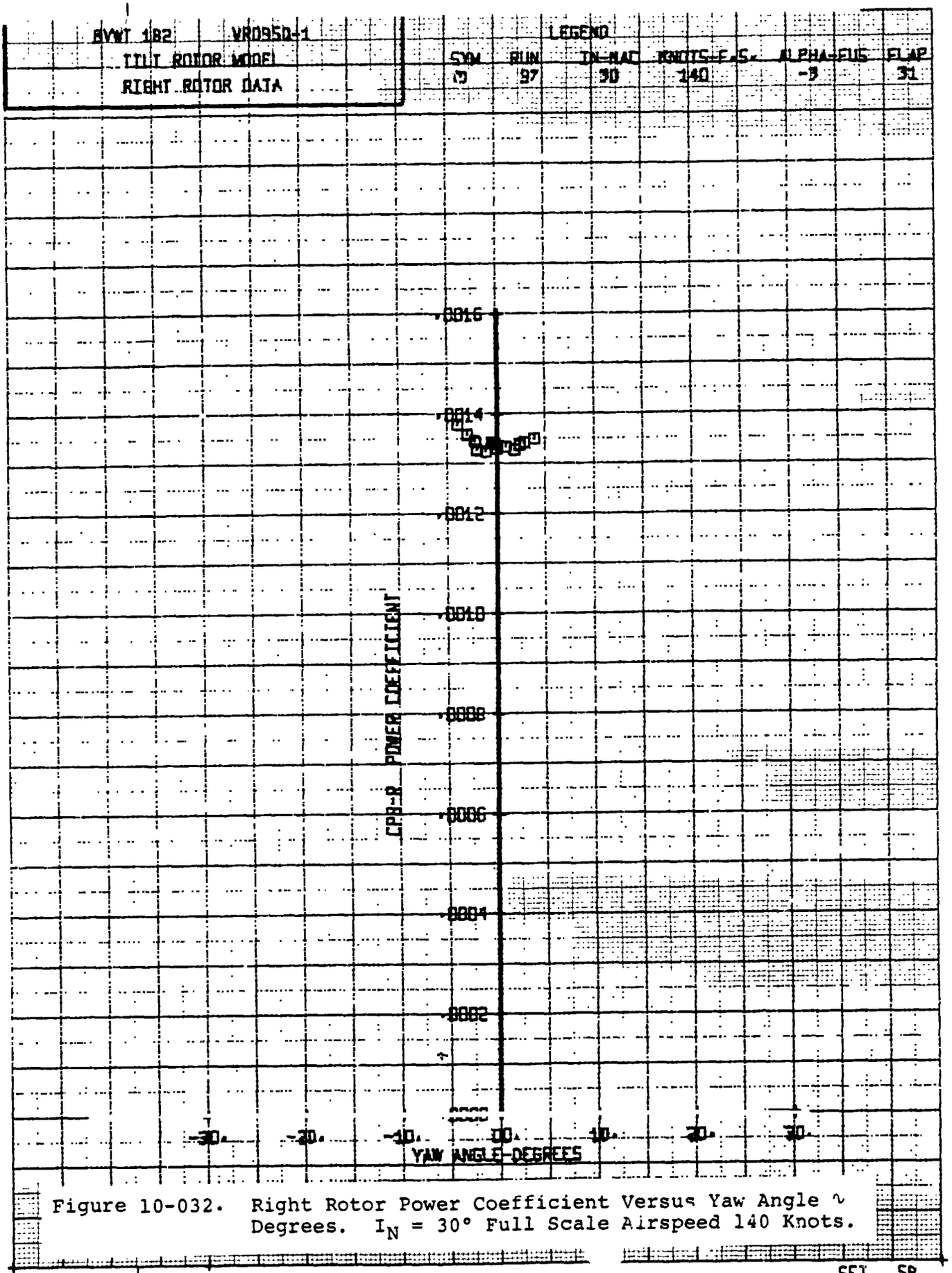


Figure 10-032. Right Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

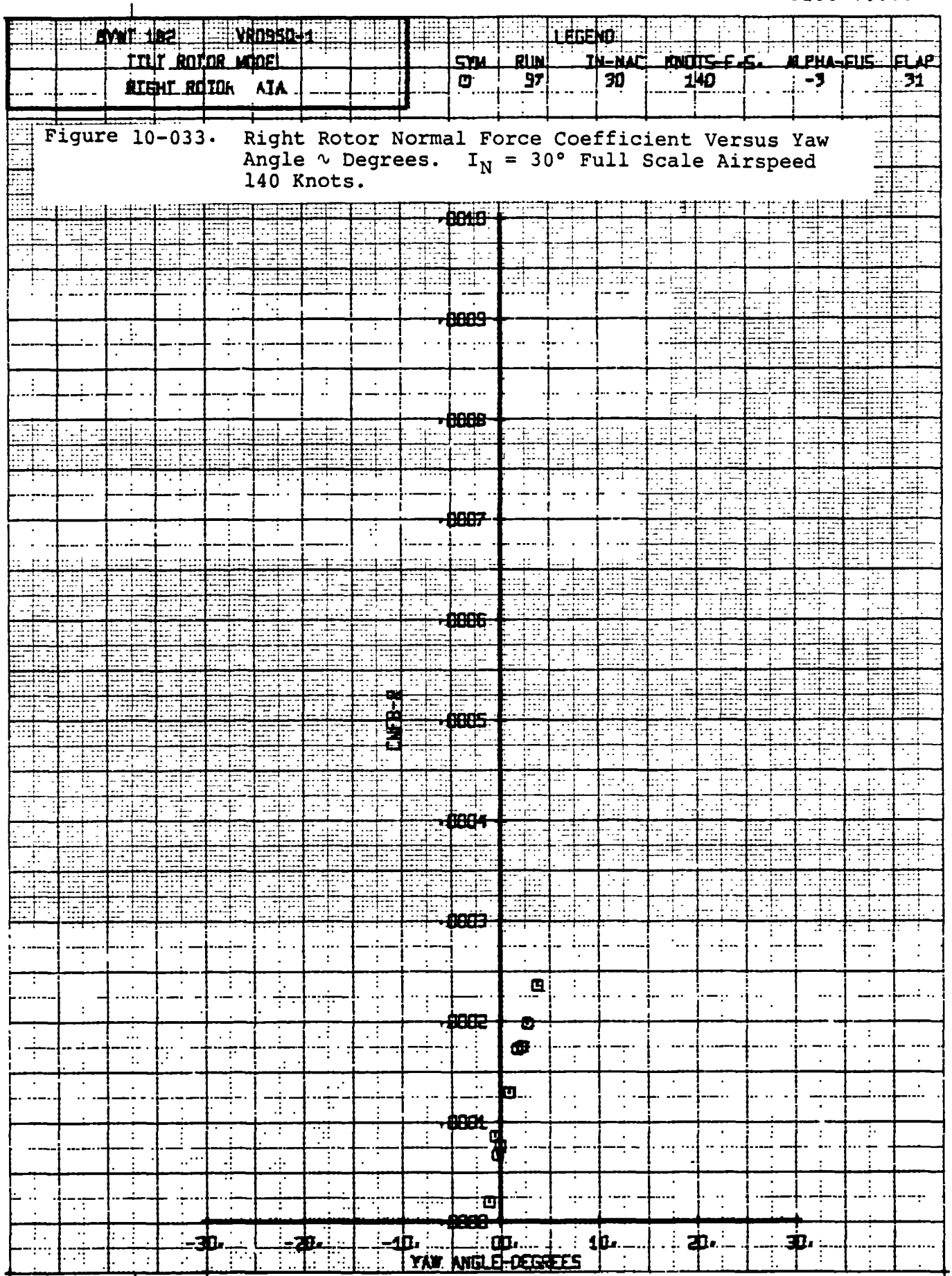


Figure 10-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

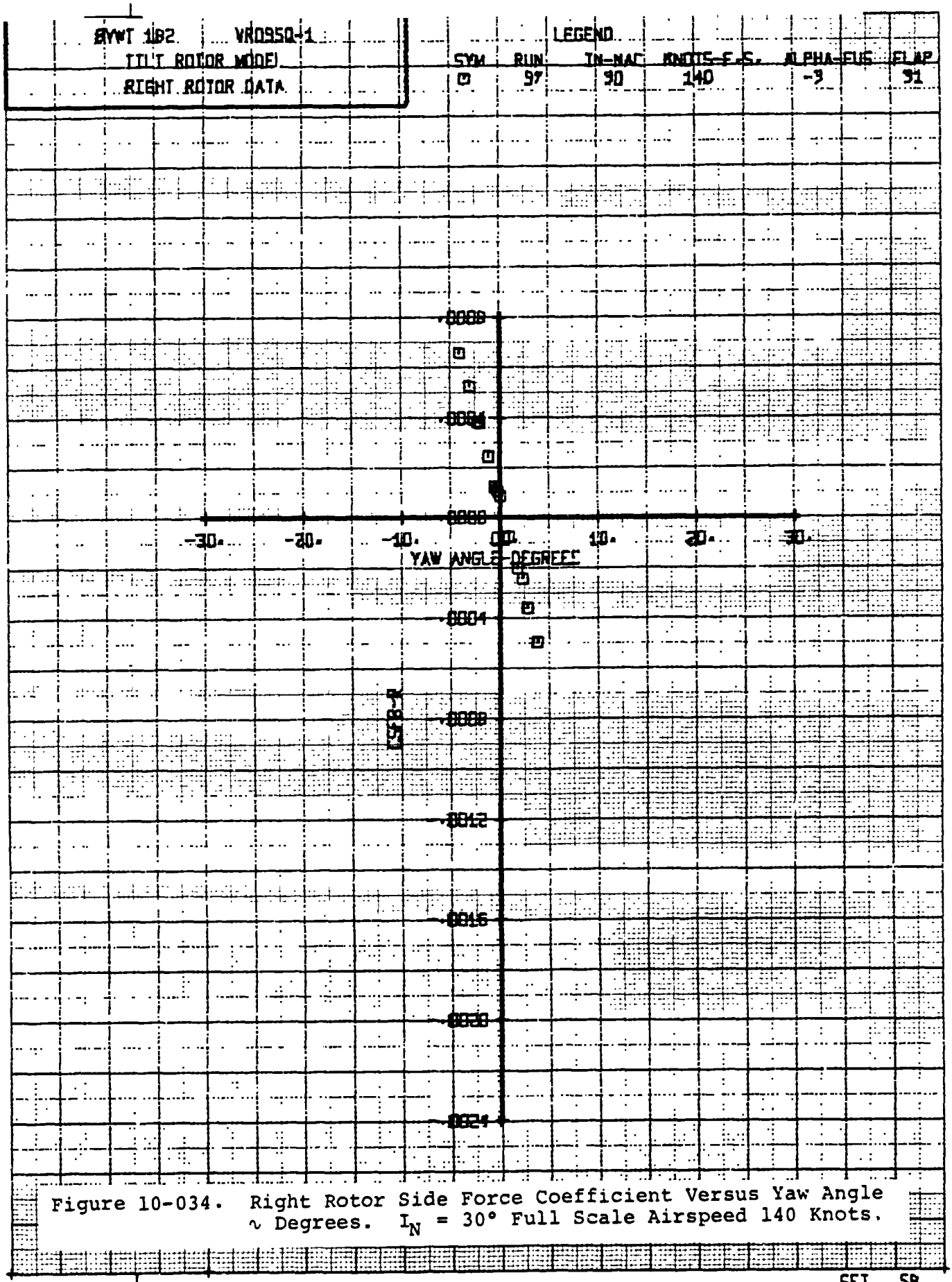


Figure 10-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

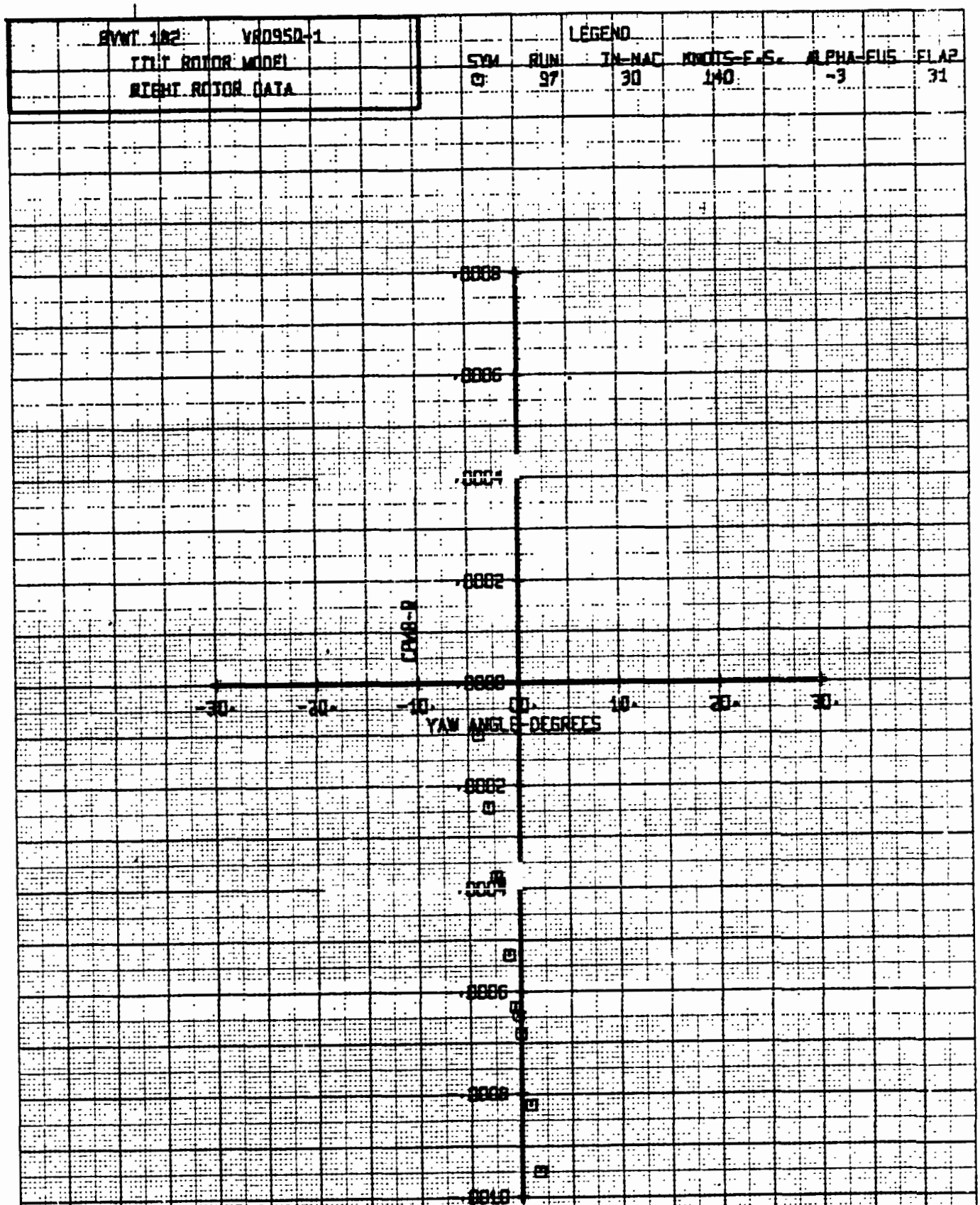


Figure 10-035. Right Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

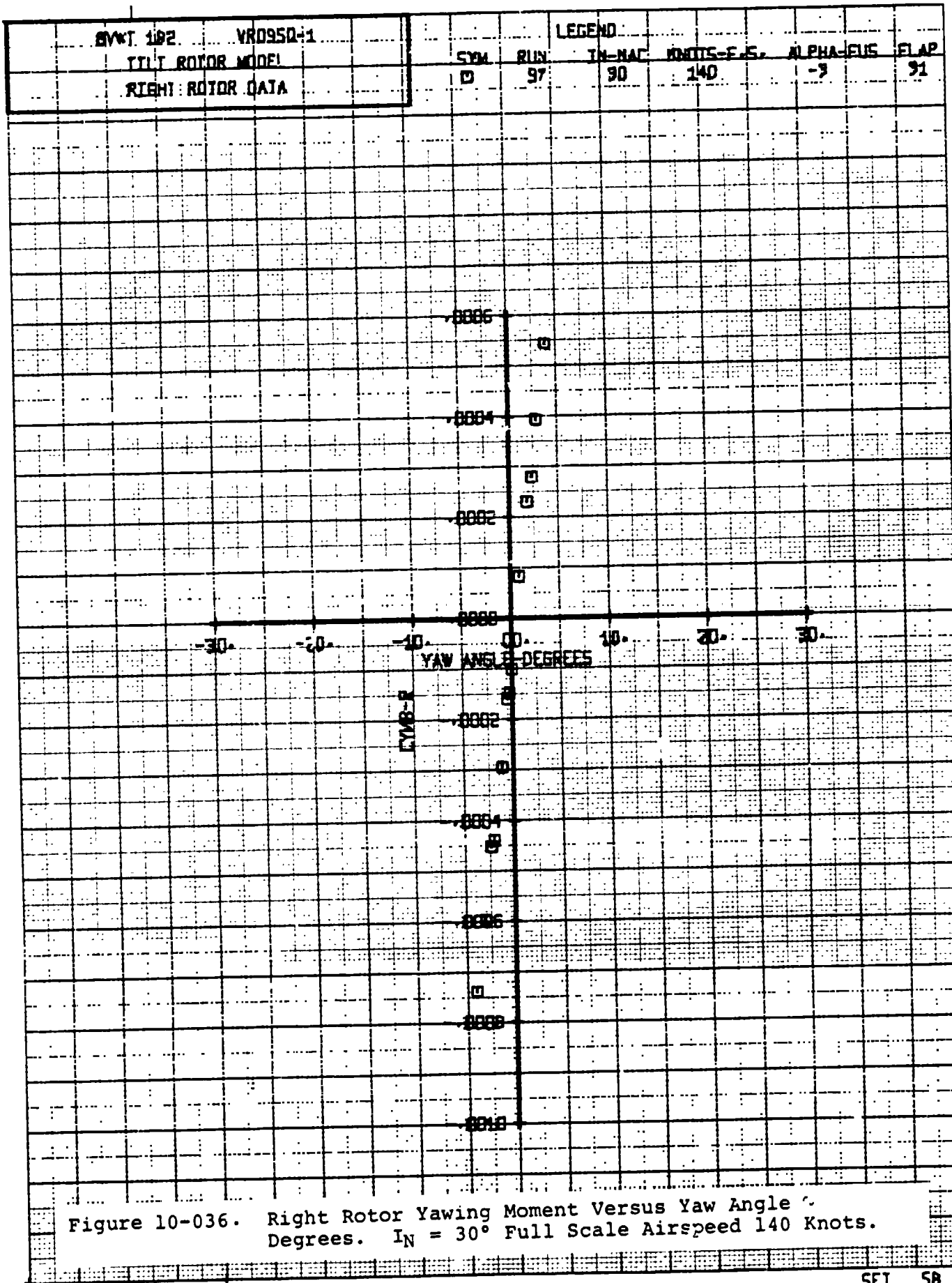


Figure 10-036. Right Rotor Yawing Moment Versus Yaw Angle Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

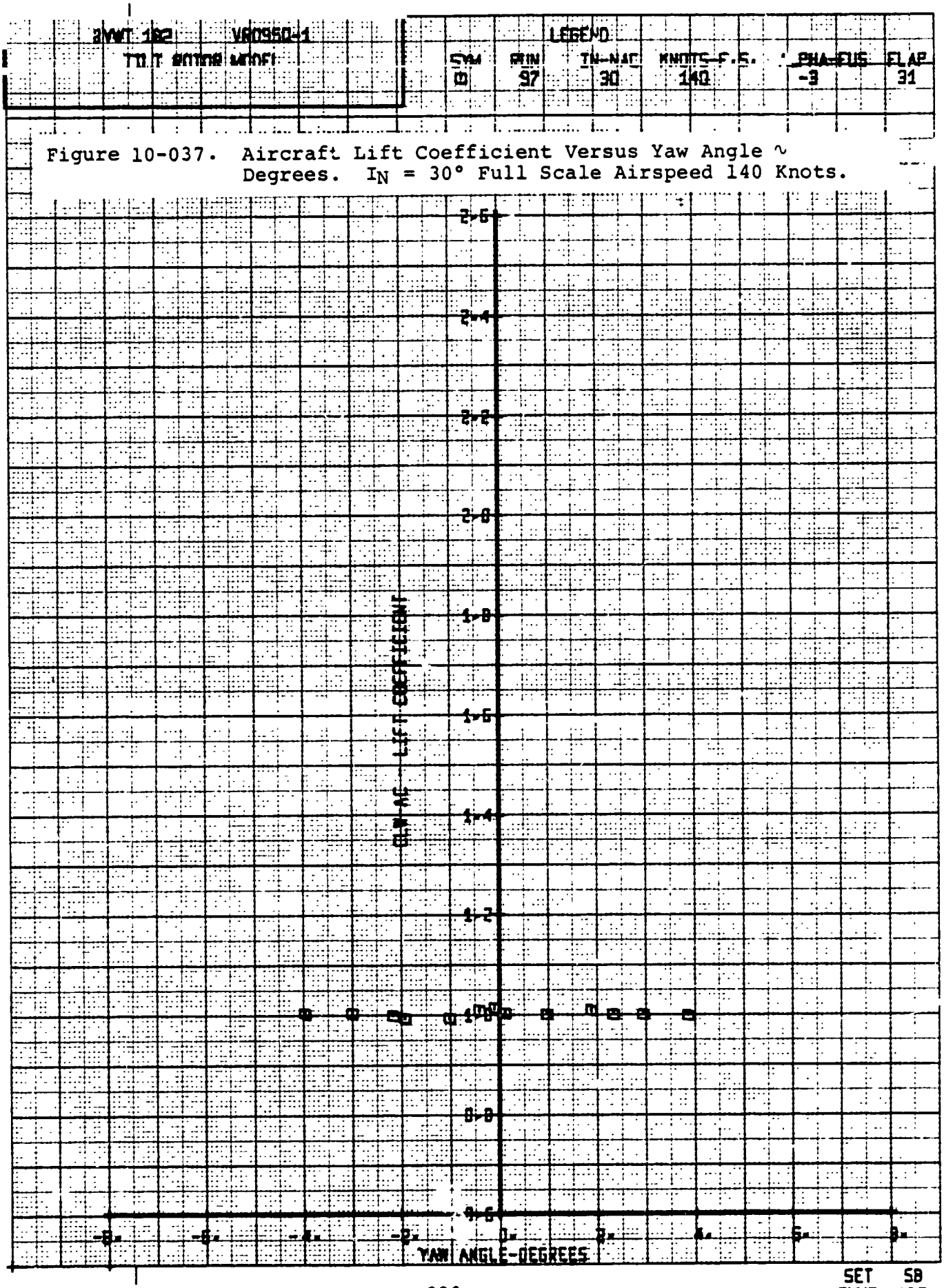


Figure 10-037. Aircraft Lift Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

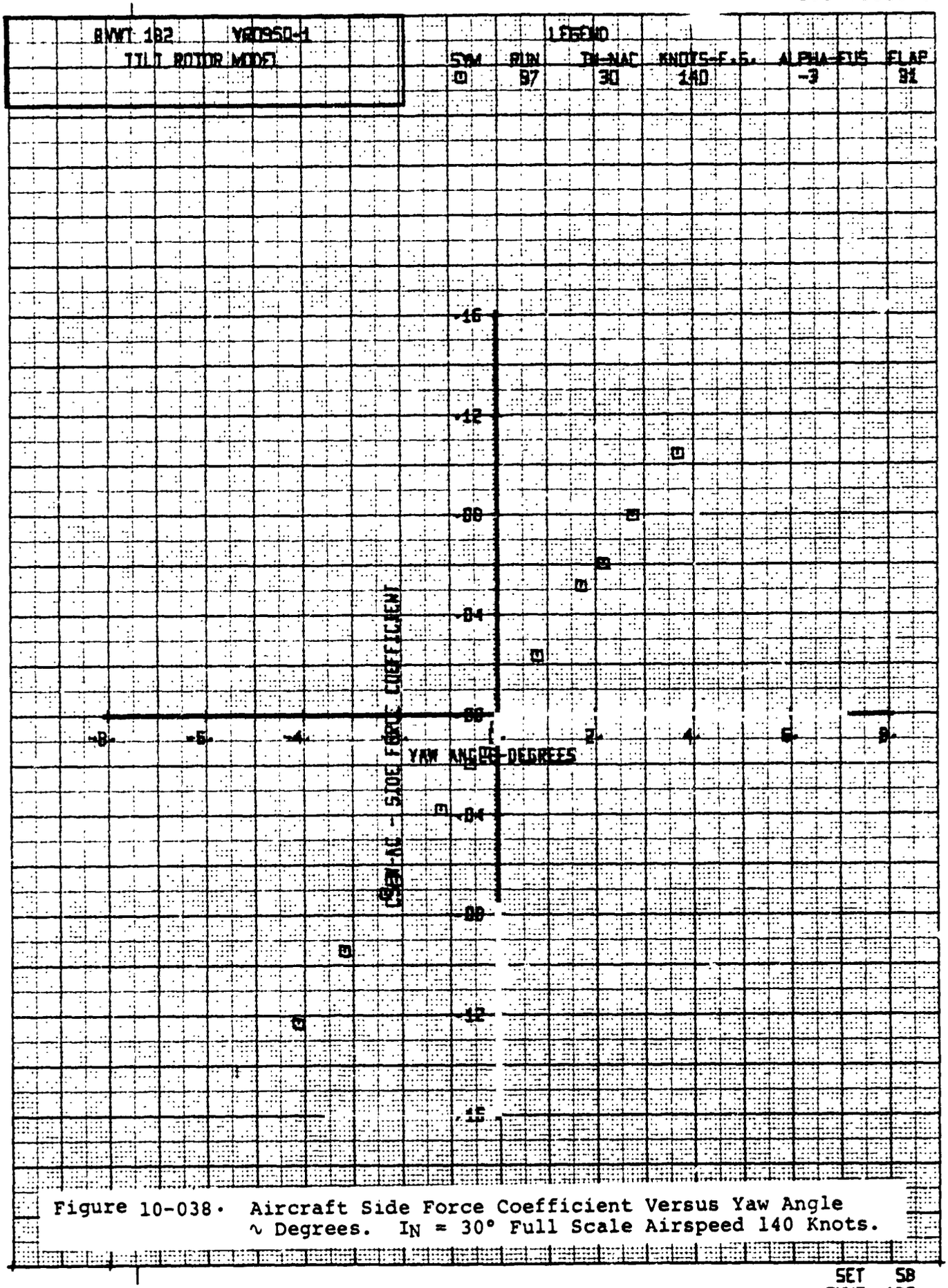


Figure 10-038. Aircraft Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

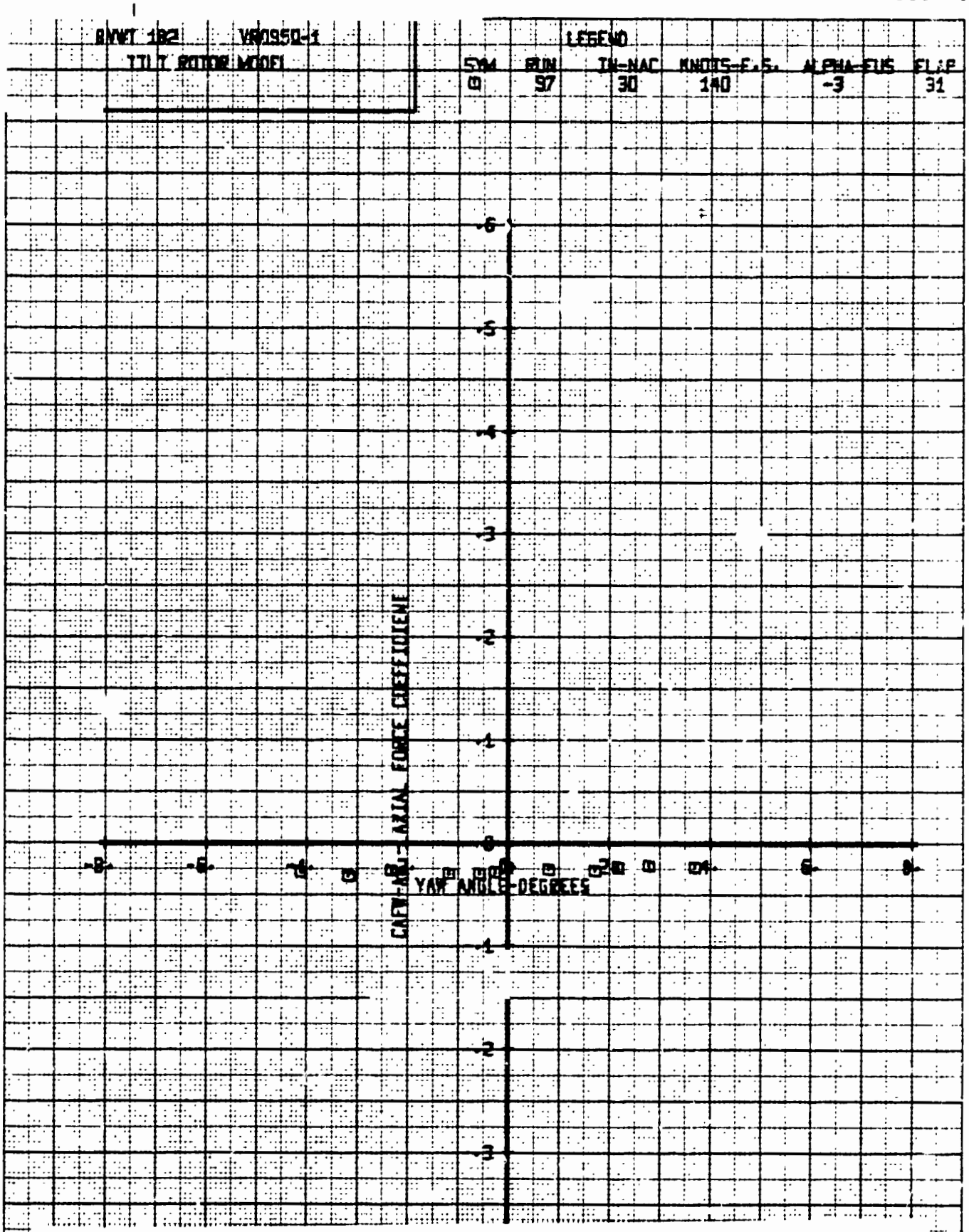


Figure 10-039. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

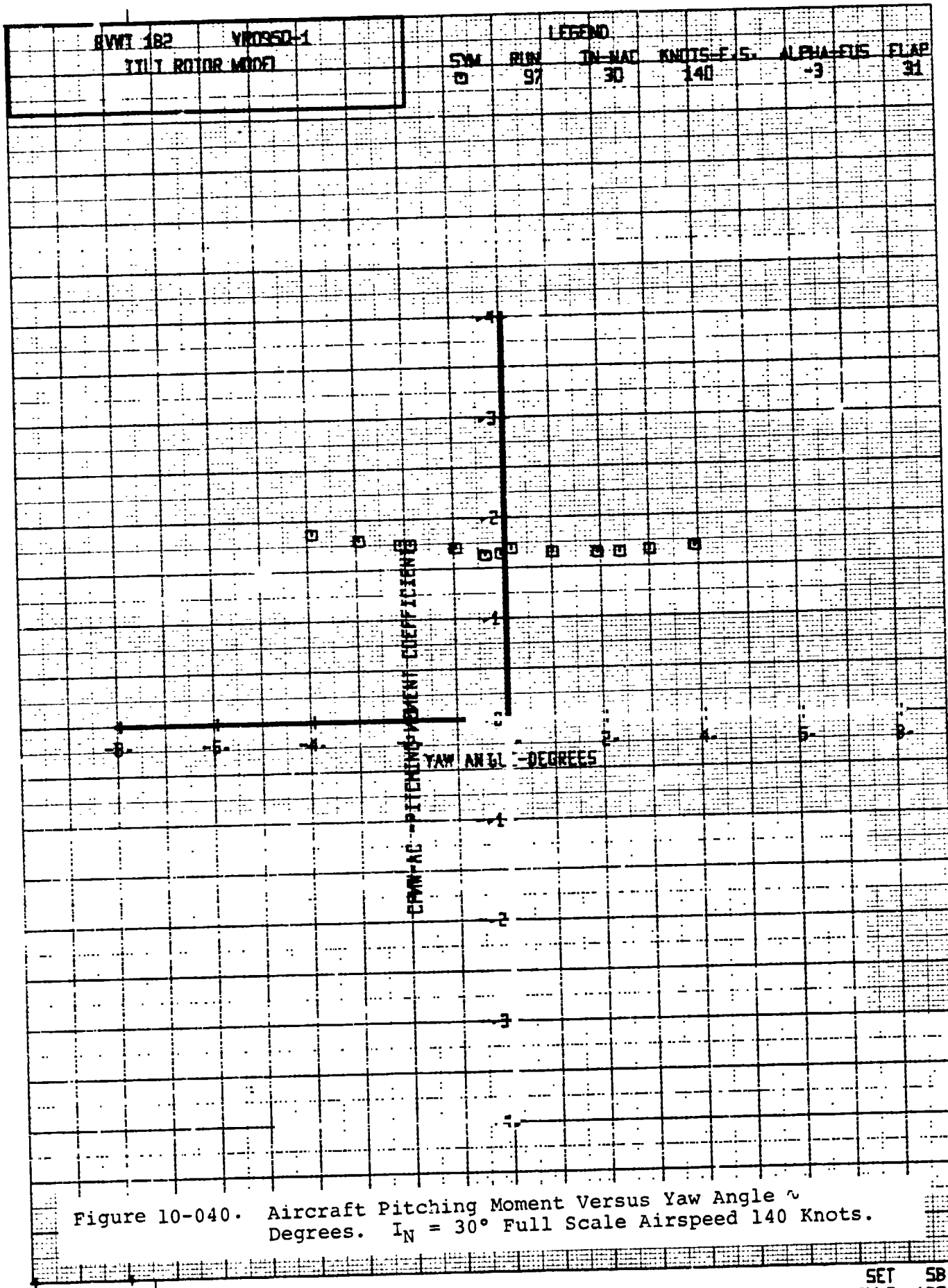


Figure 10-040. Aircraft Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

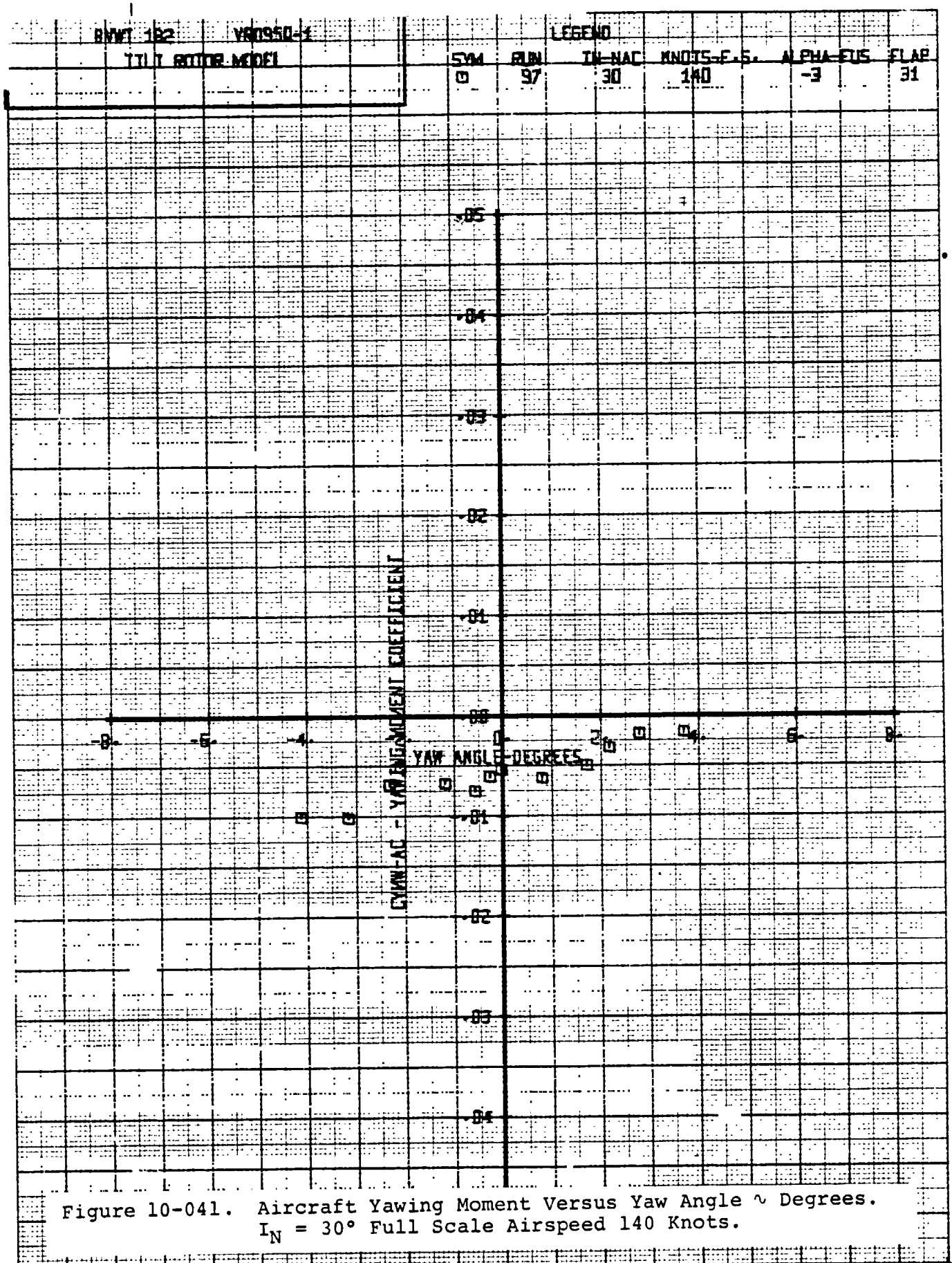


Figure 10-041. Aircraft Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

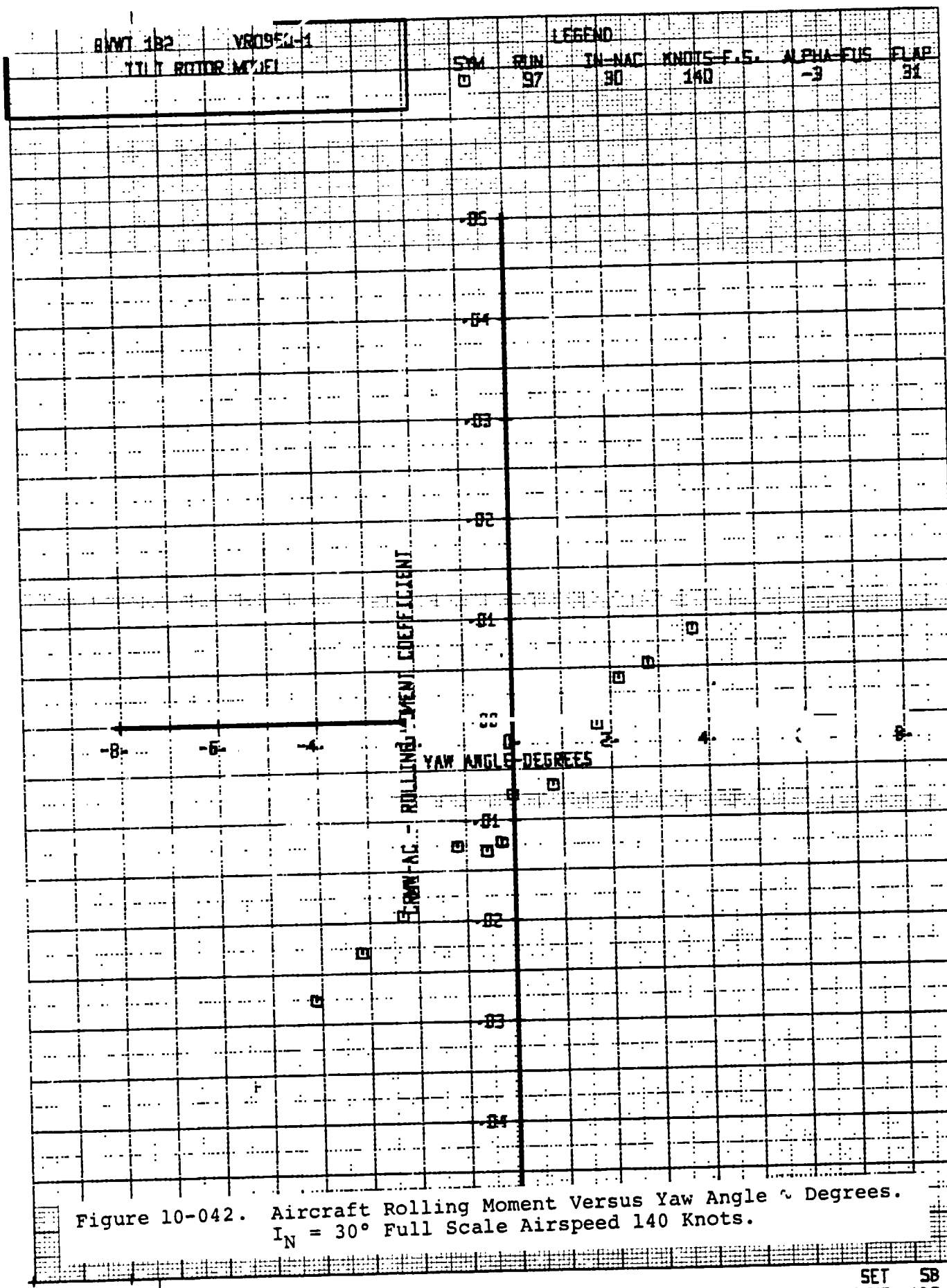


Figure 10-042. Aircraft Rolling Moment Versus Yaw Angle - Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

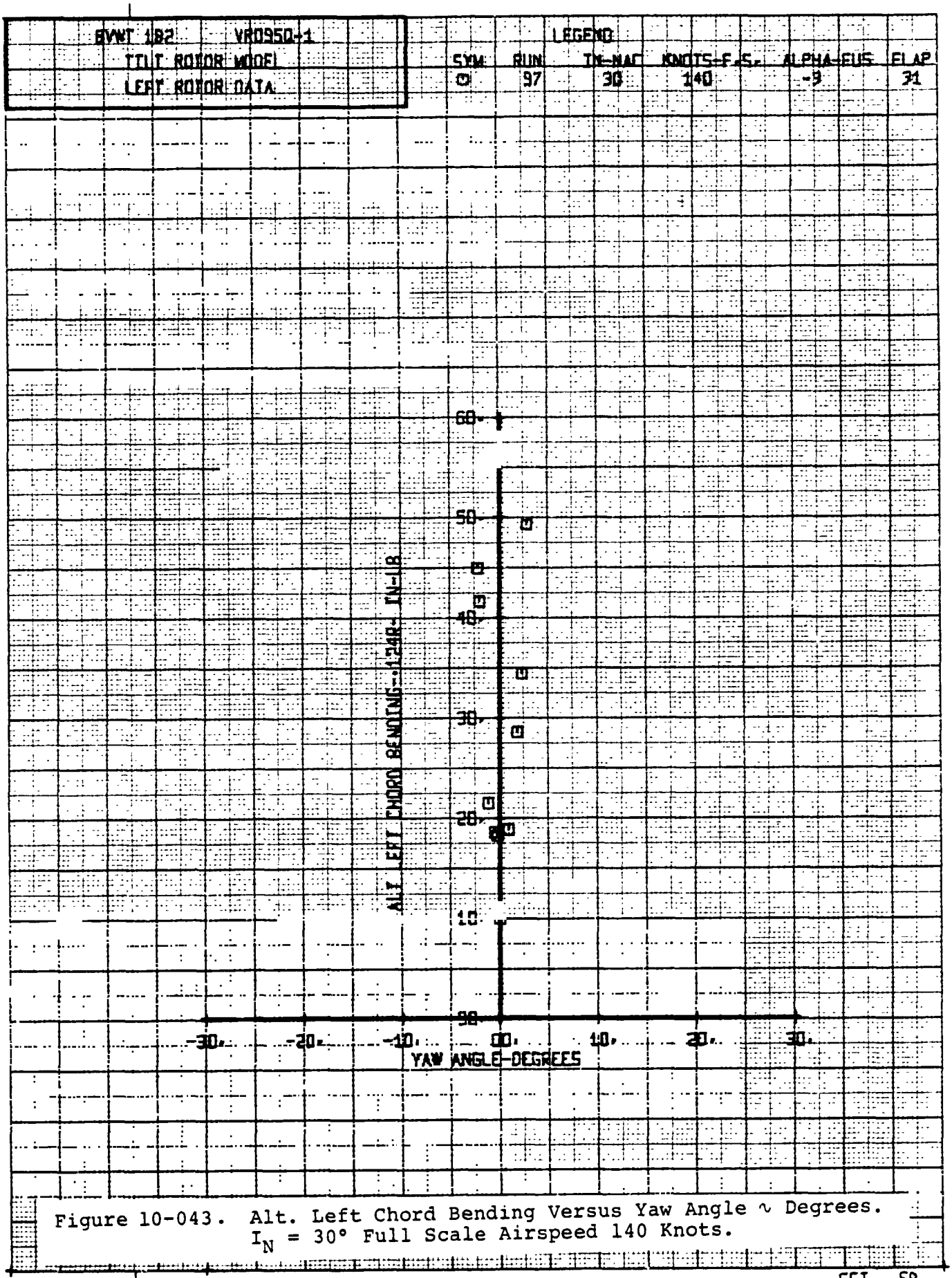


Figure 10-043. Alt. Left Chord Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

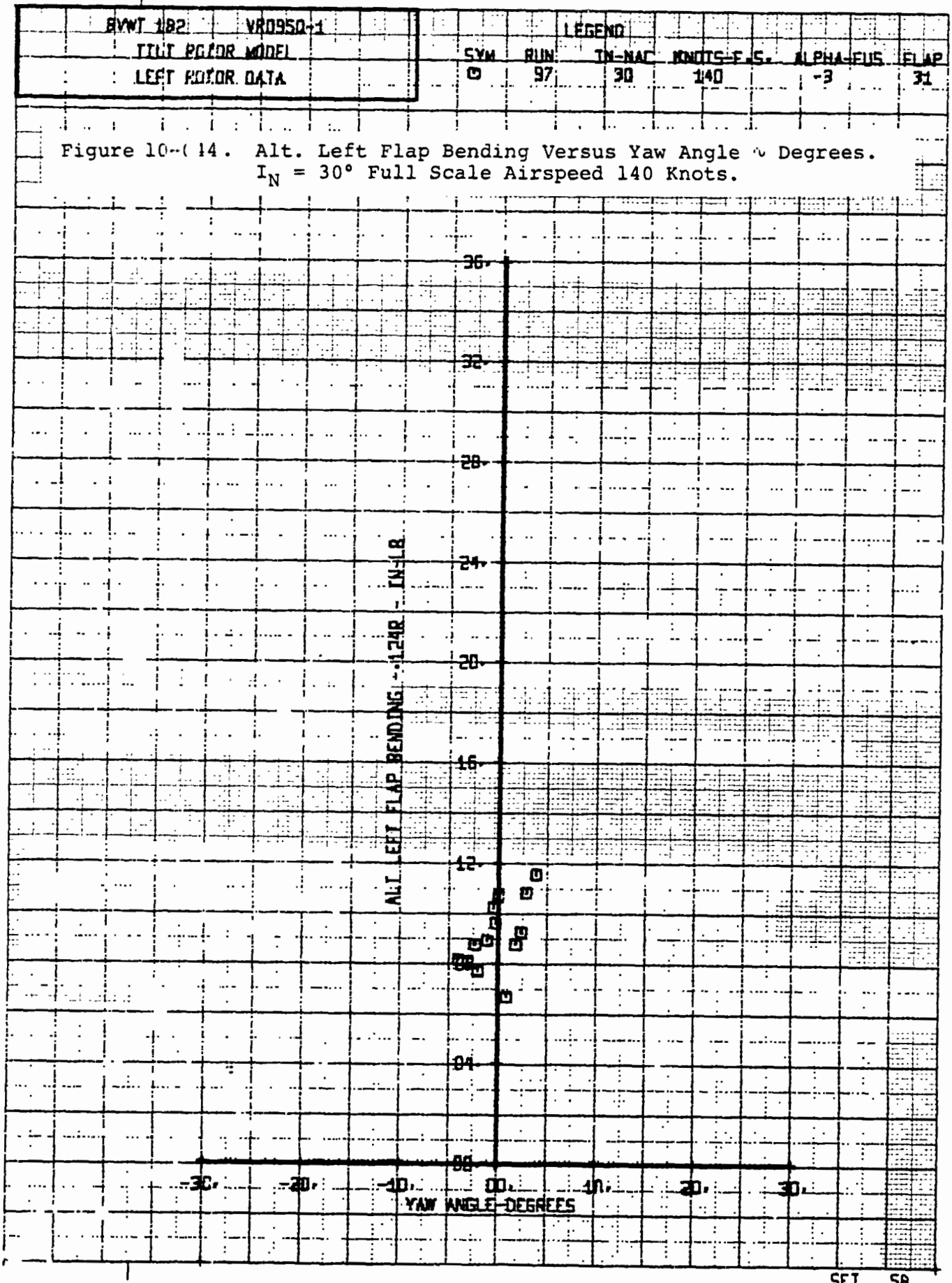


Figure 10-(14. Alt. Left Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

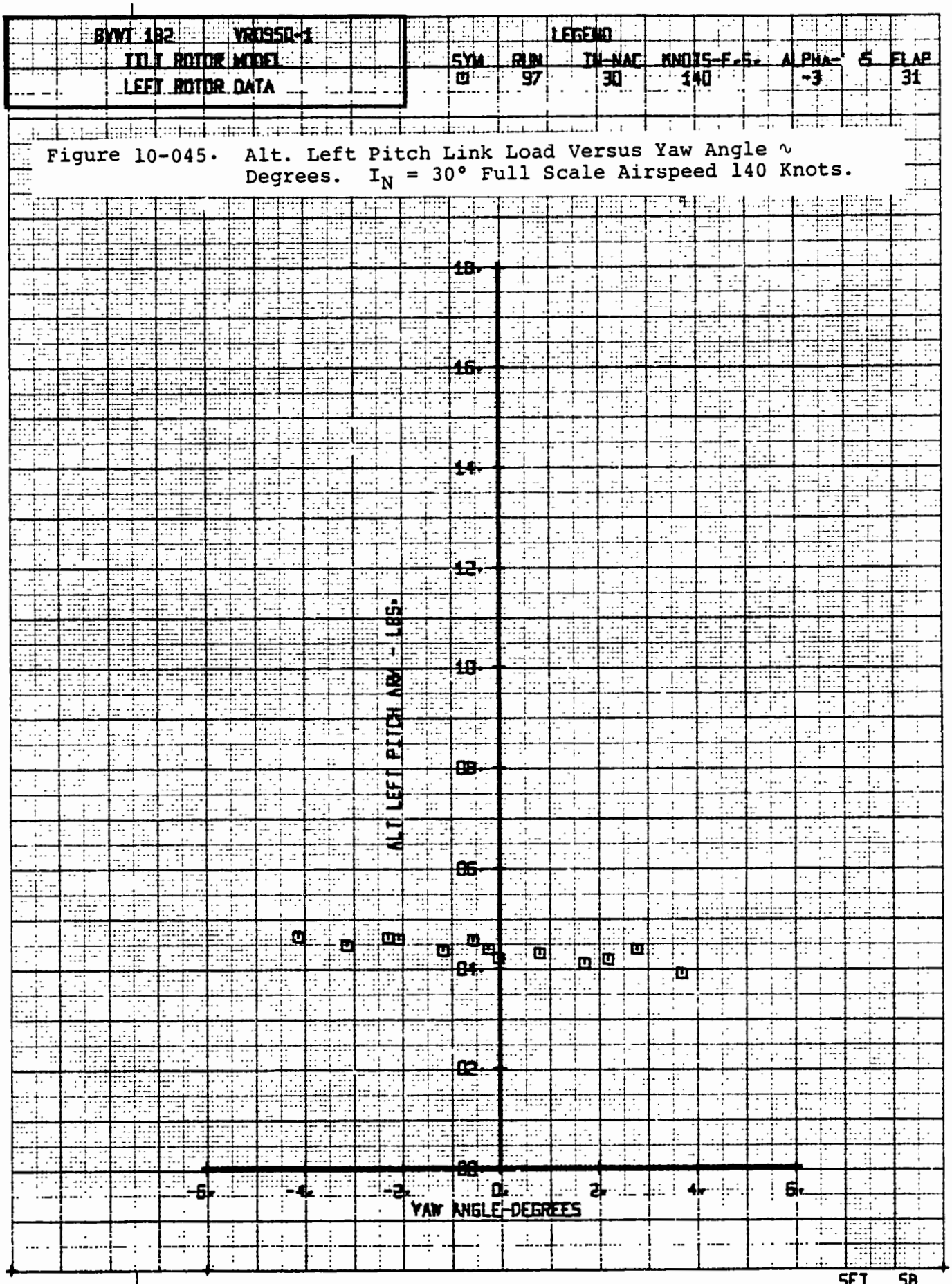


Figure 10-045. Alt. Left Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

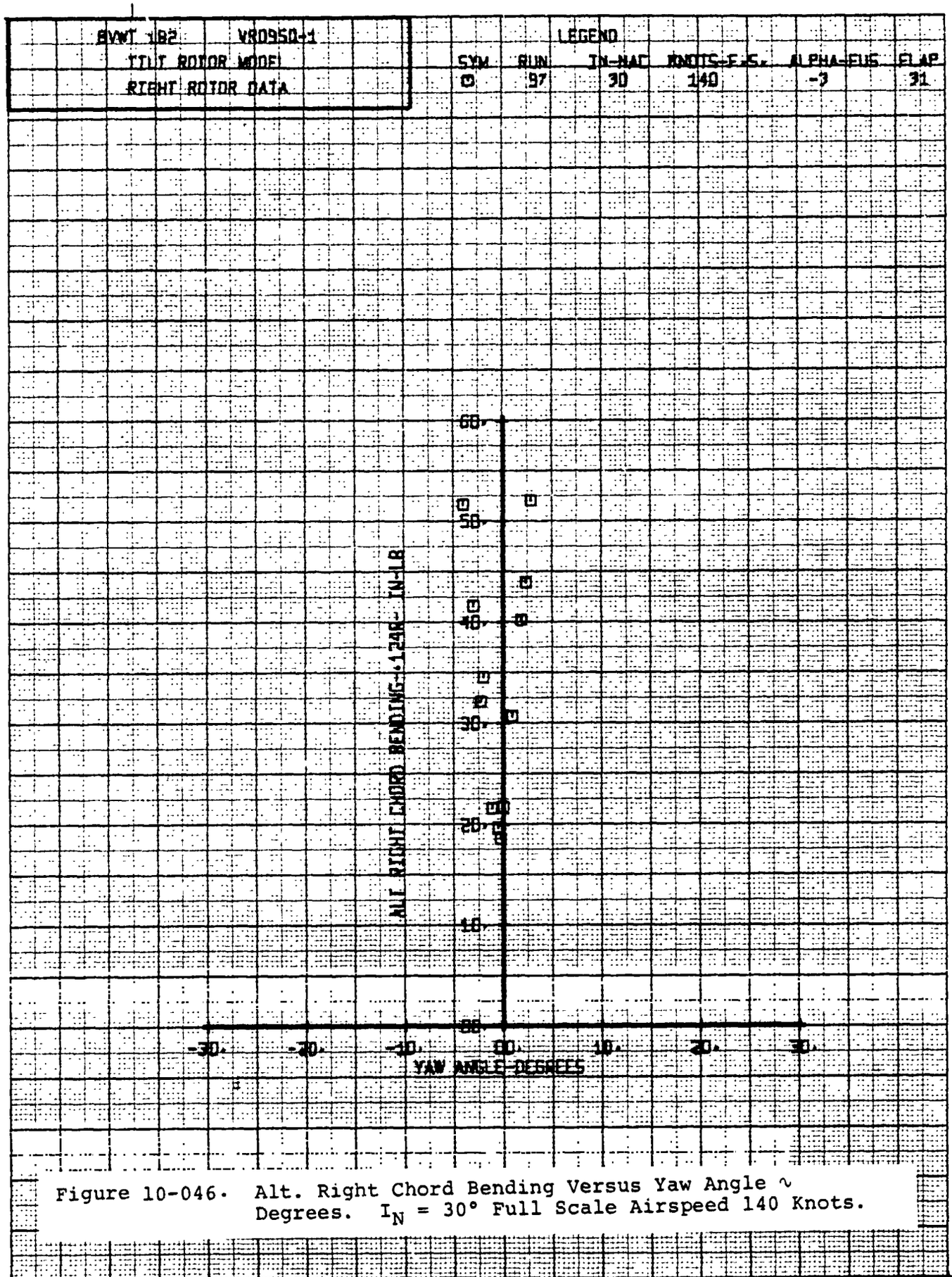


Figure 10-046. Alt. Right Chord Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

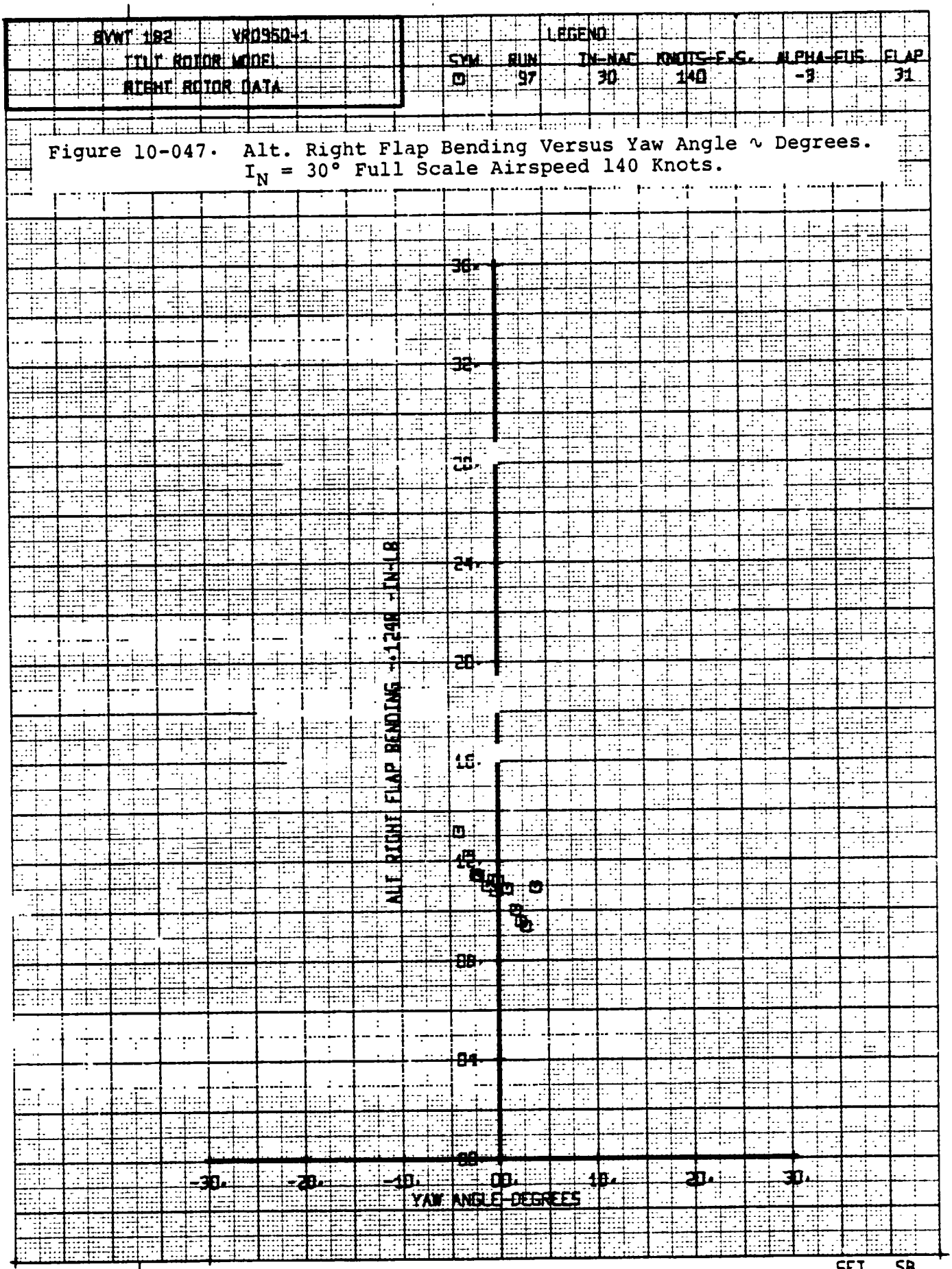


Figure 10-047. Alt. Right Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

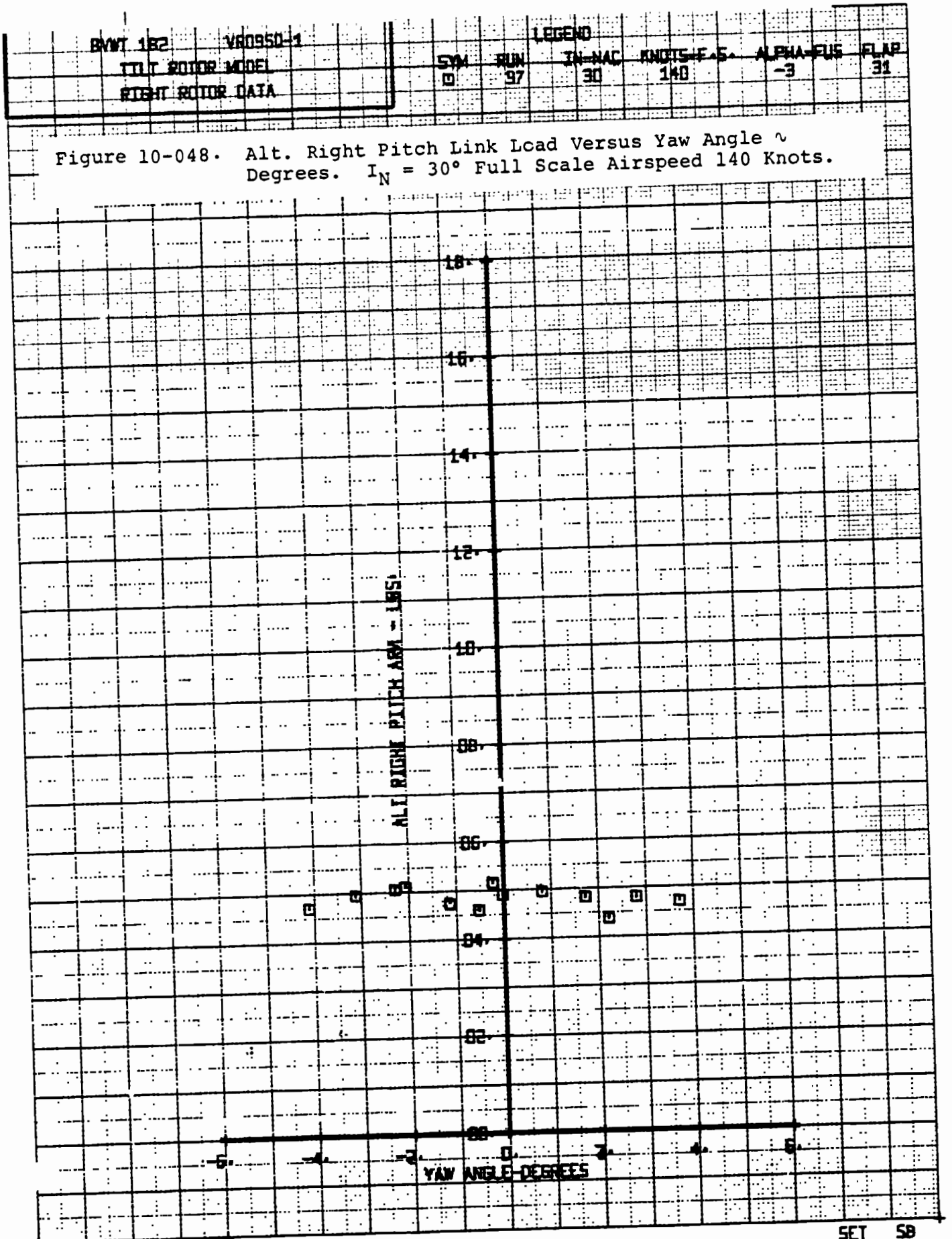


Figure 10-048. Alt. Right Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

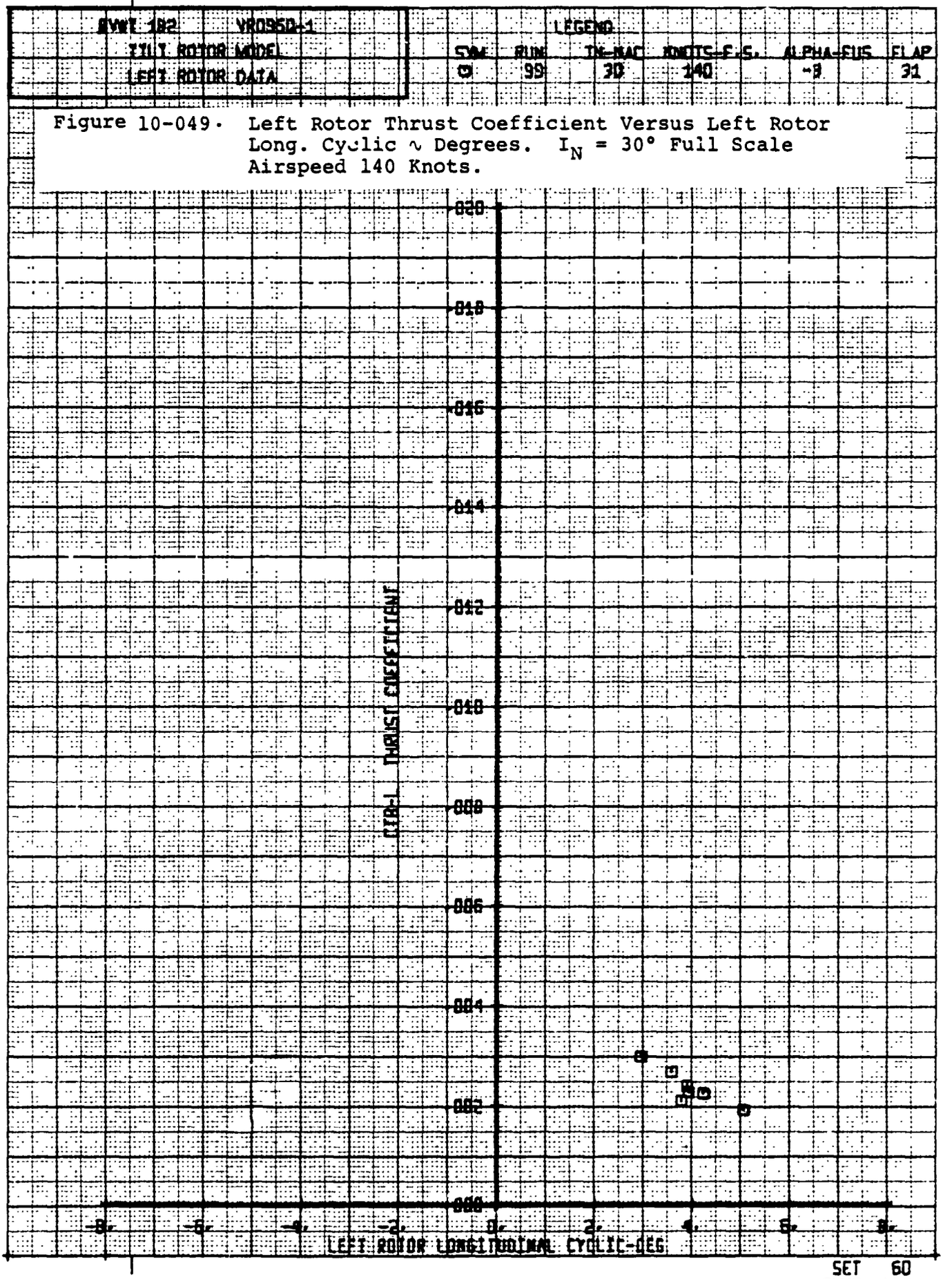


Figure 10-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

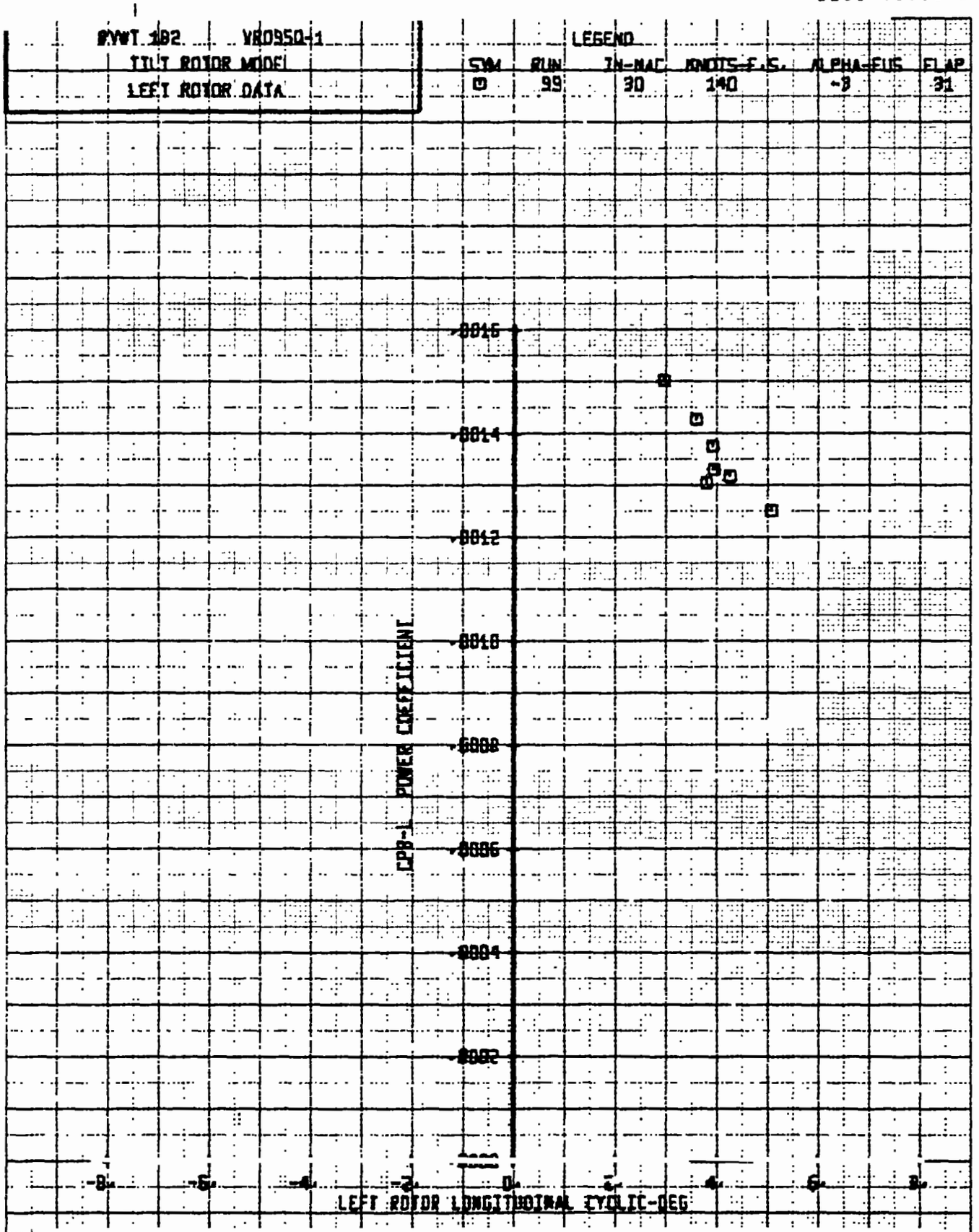


Figure 10-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

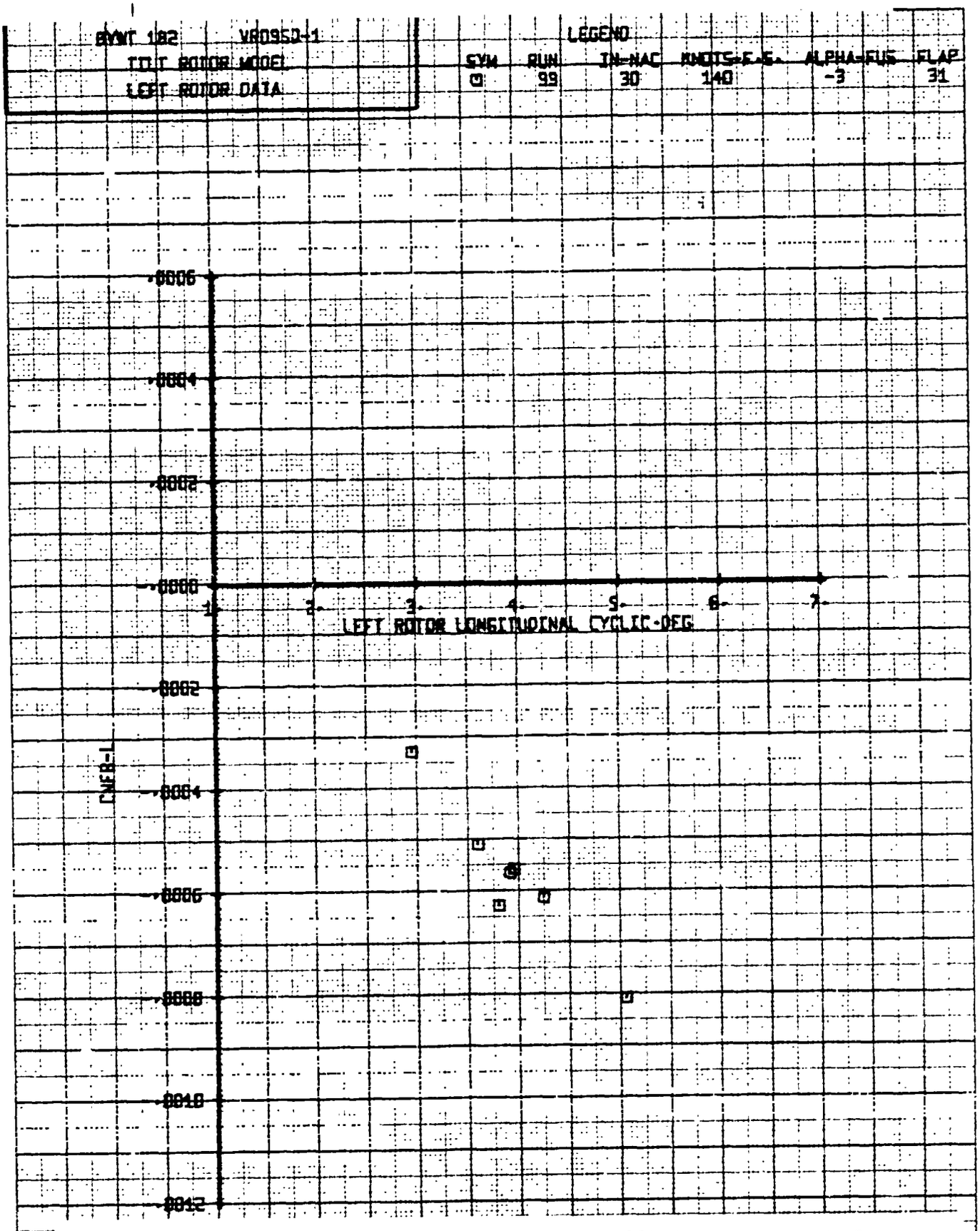


Figure 10-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

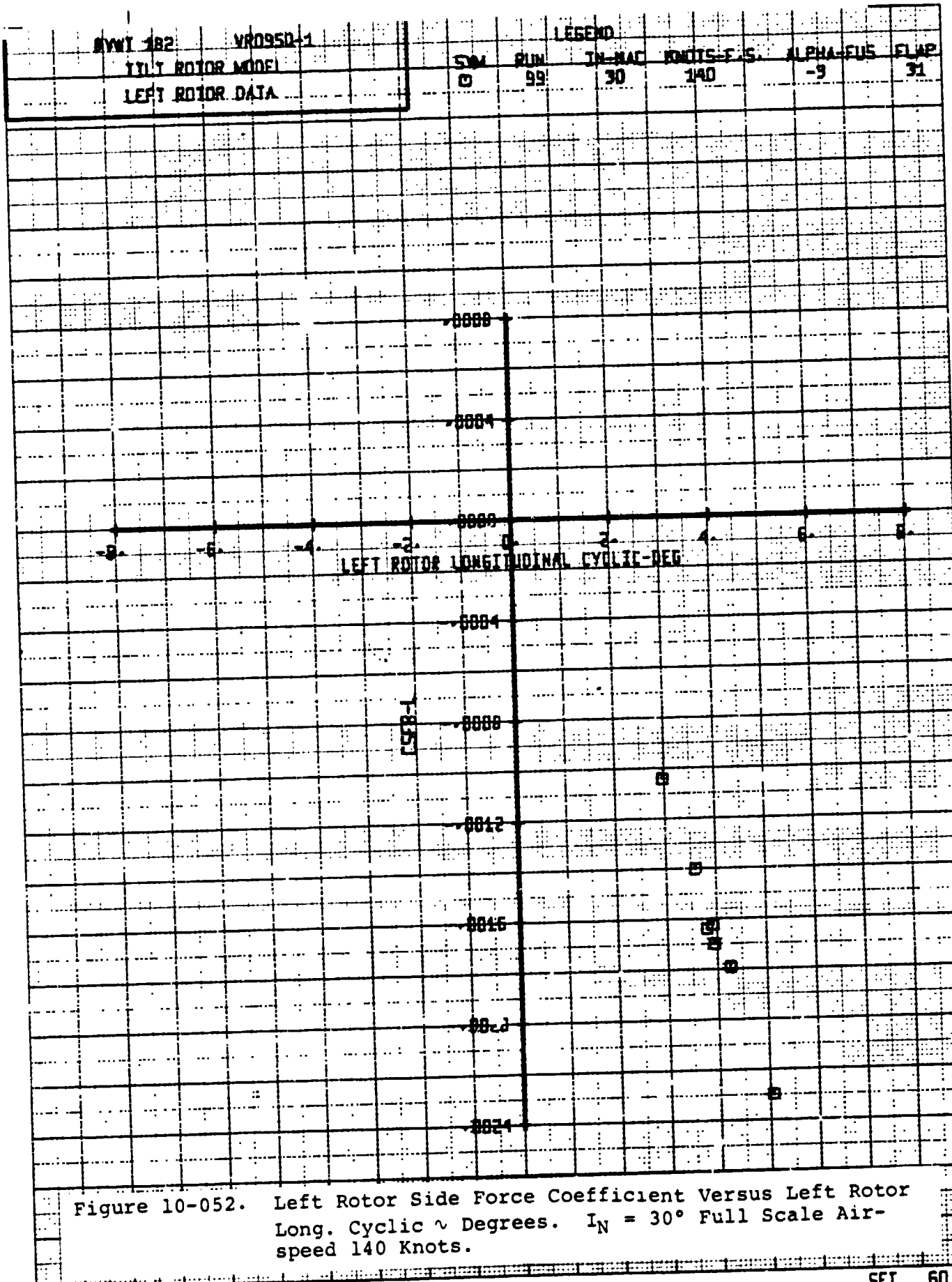


Figure 10-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

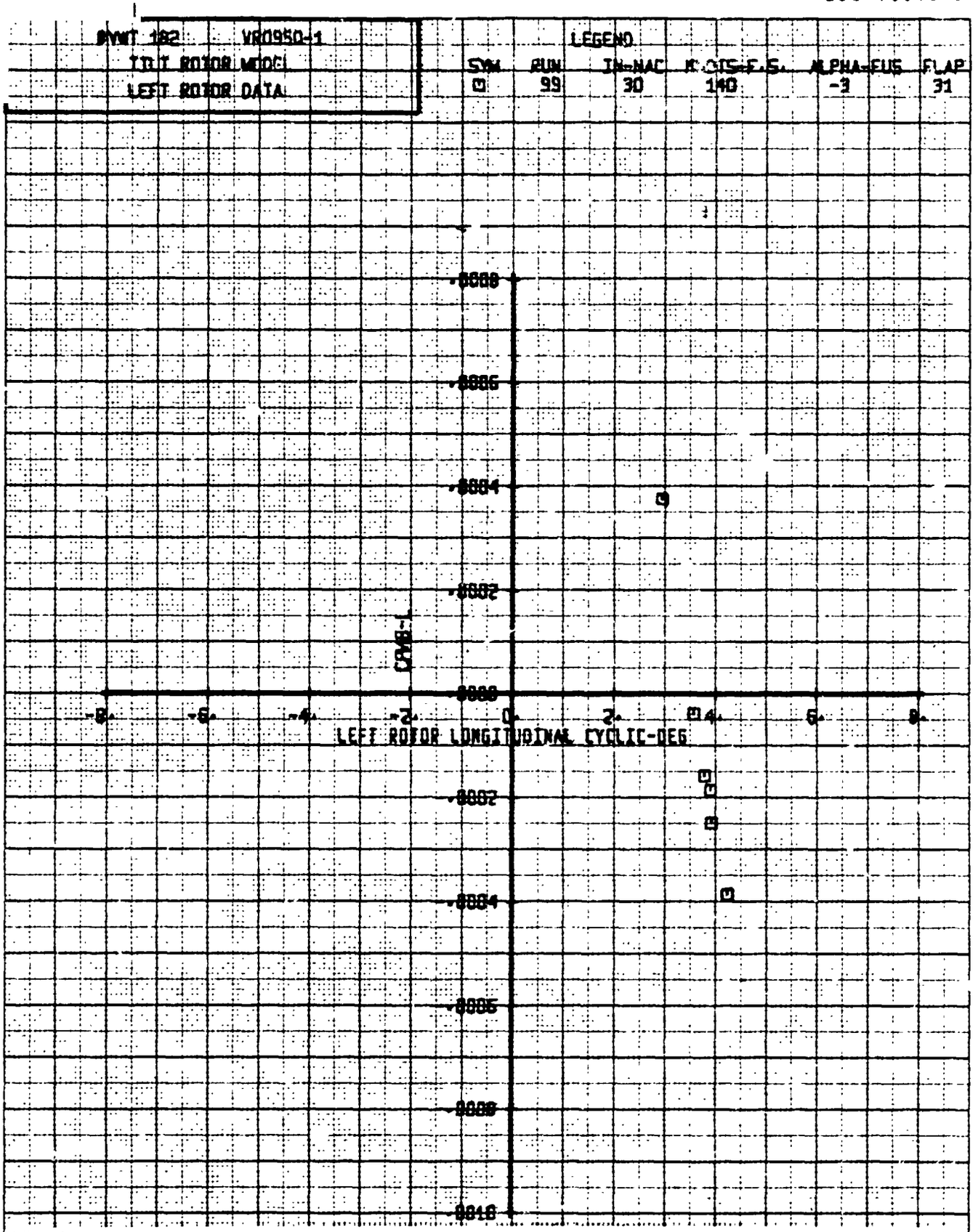


Figure 10-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

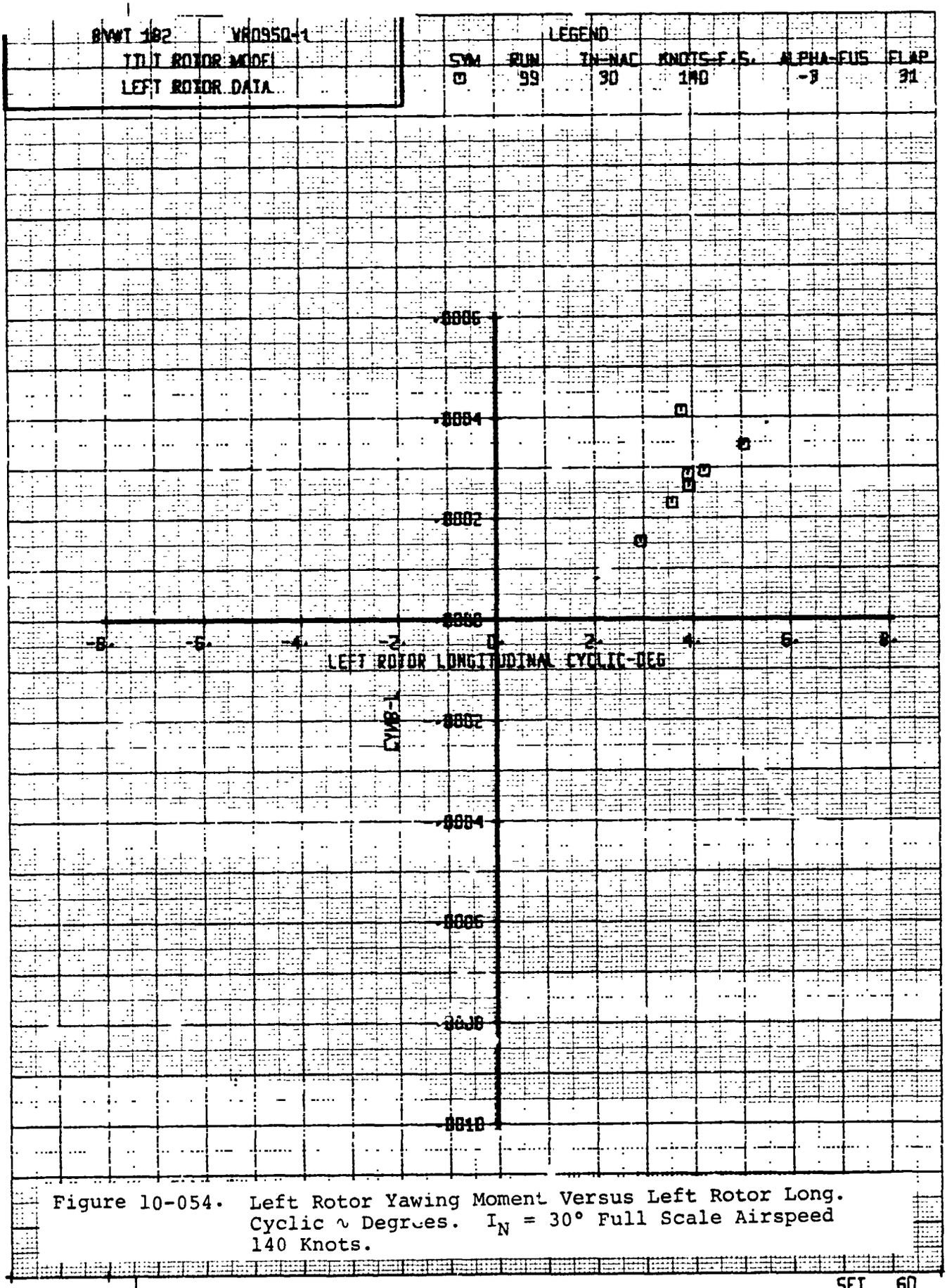


Figure 10-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

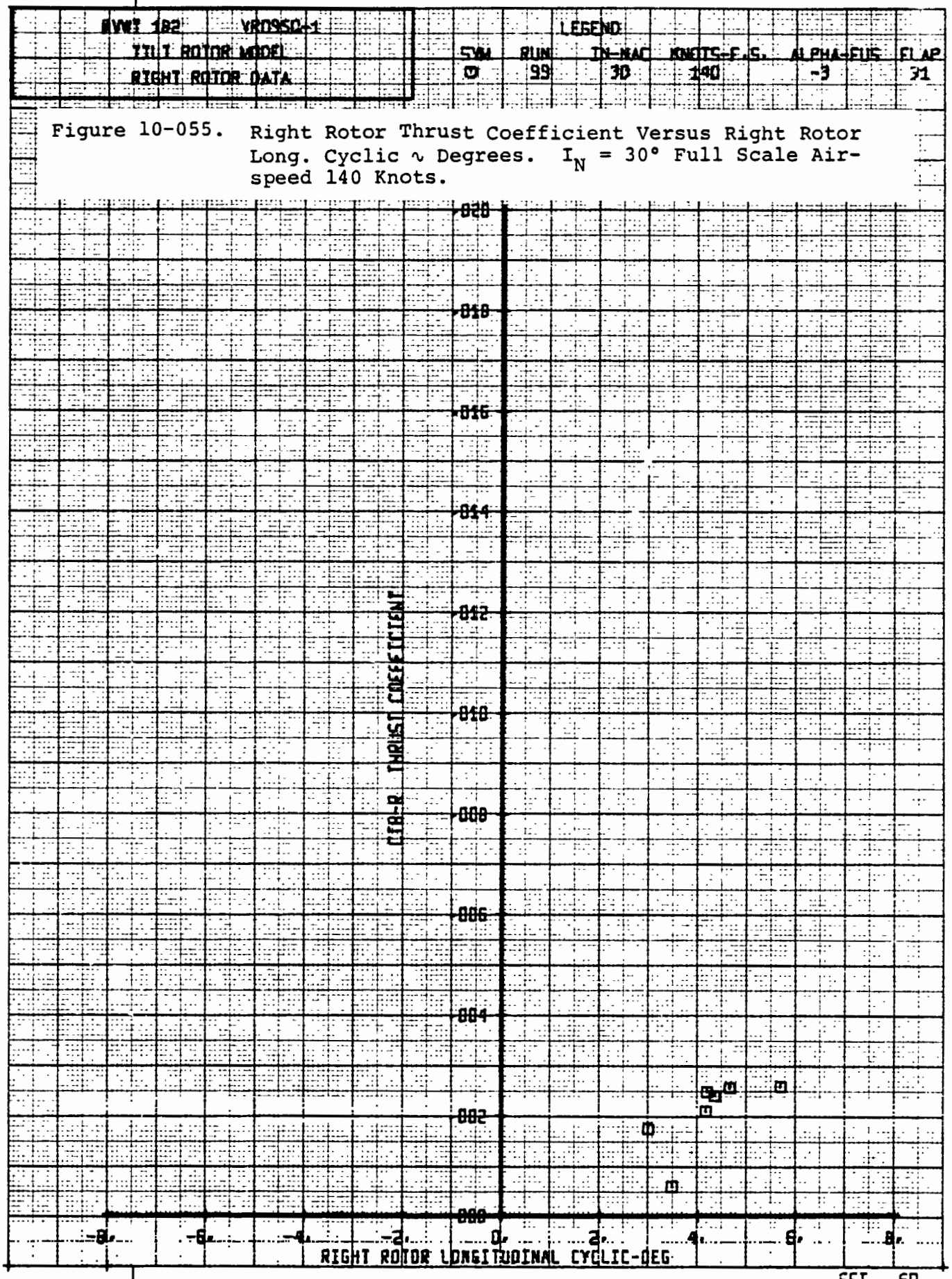


Figure 10-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

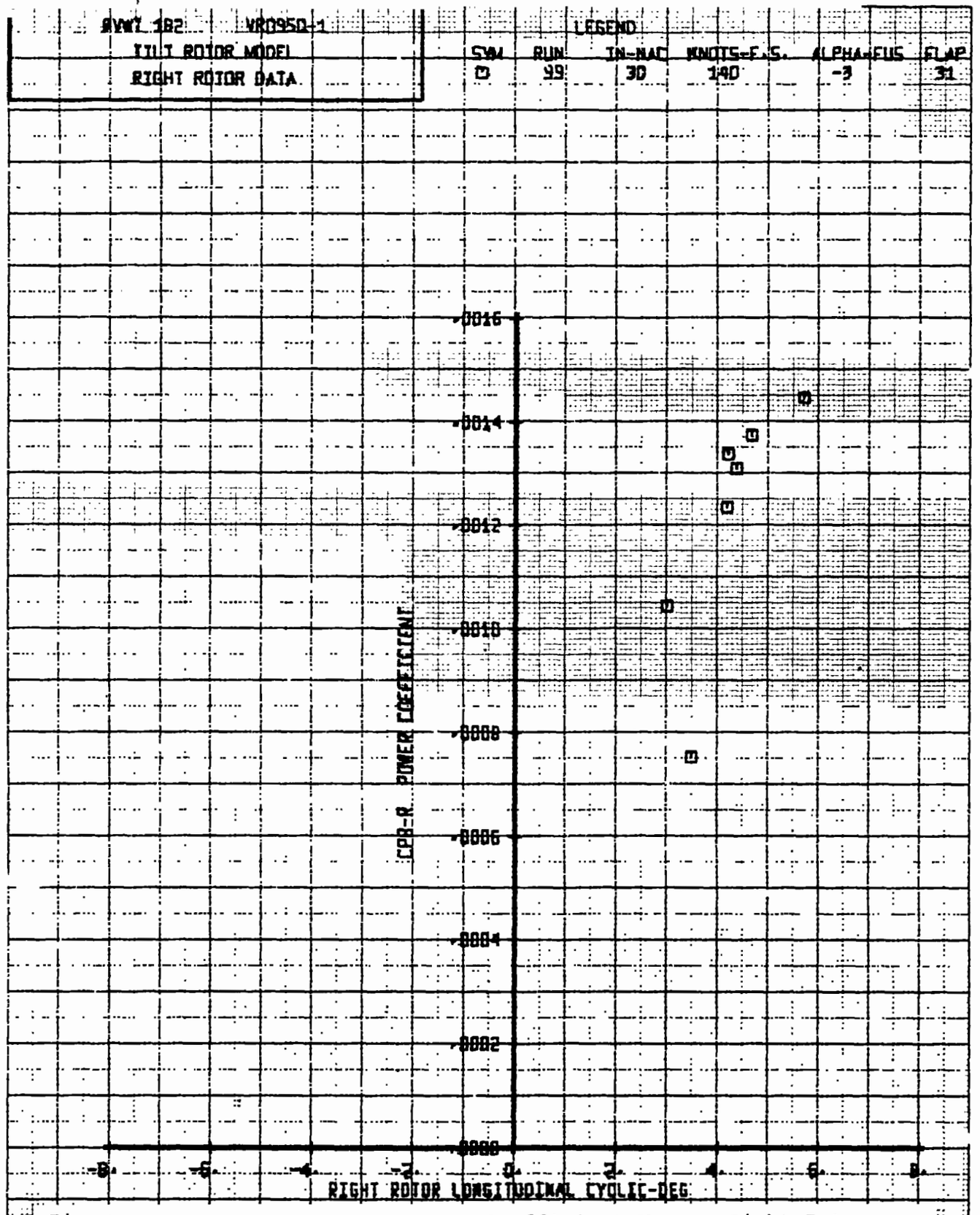


Figure 10-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

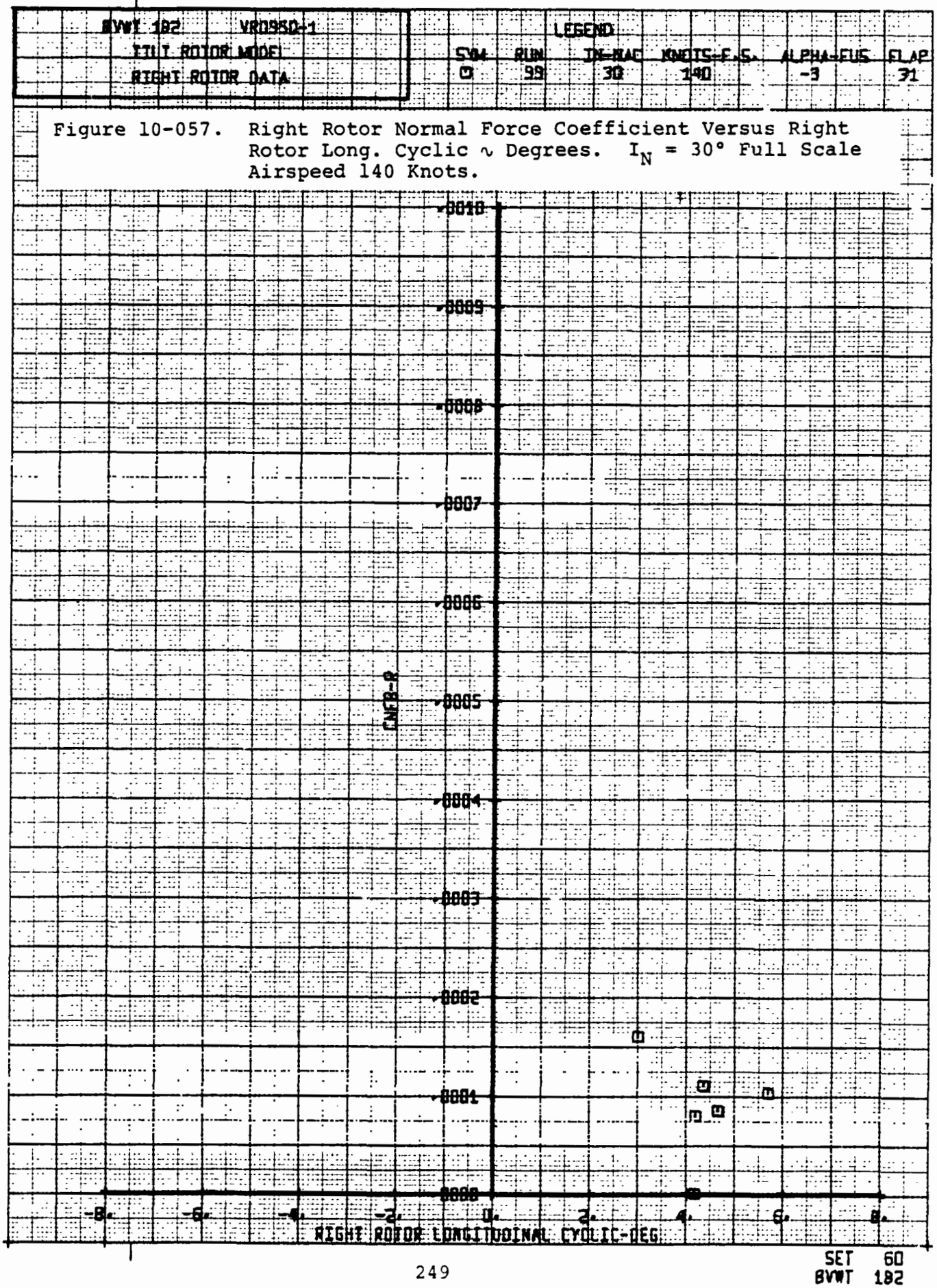


Figure 10-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

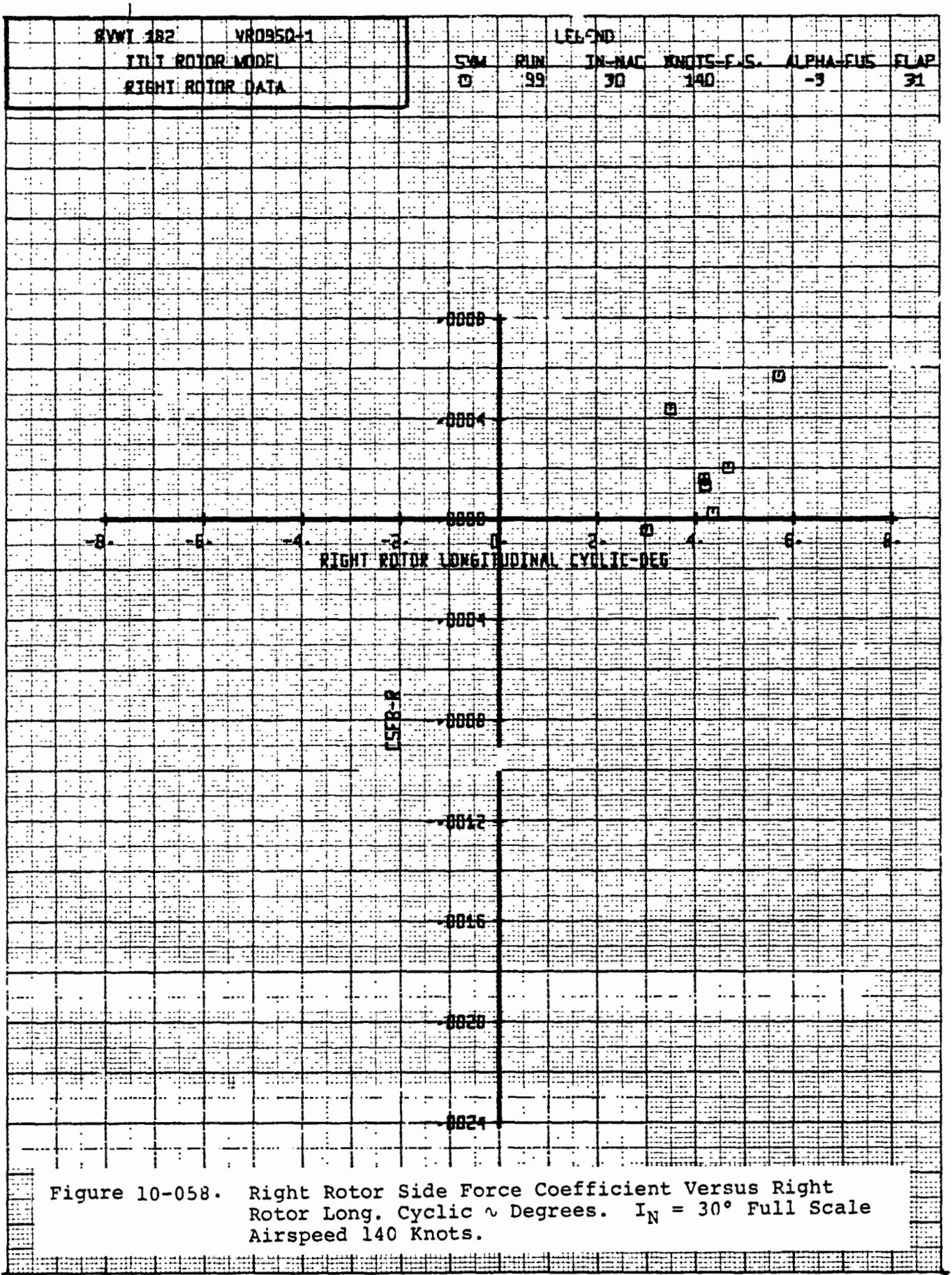


Figure 10-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

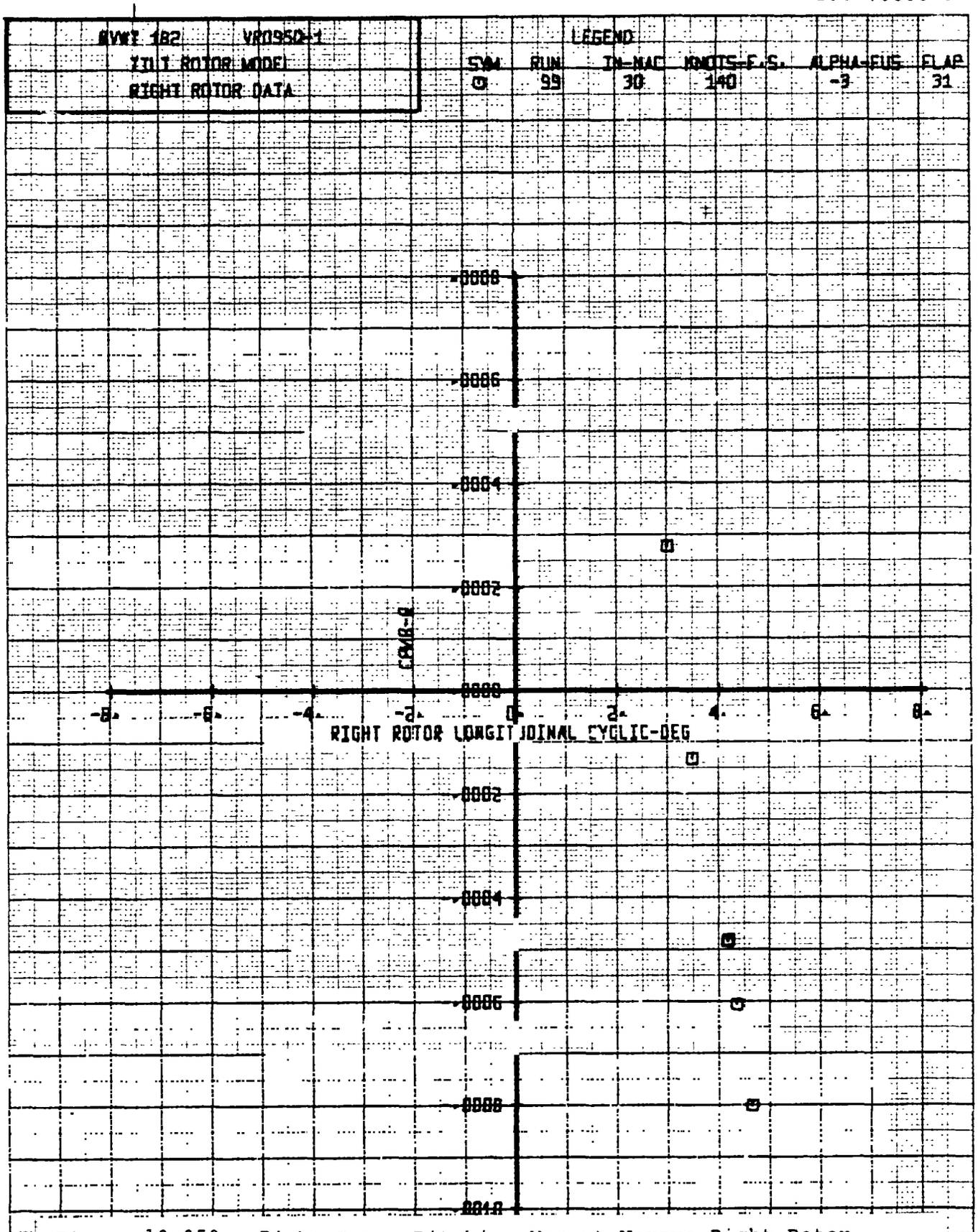


Figure 10-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

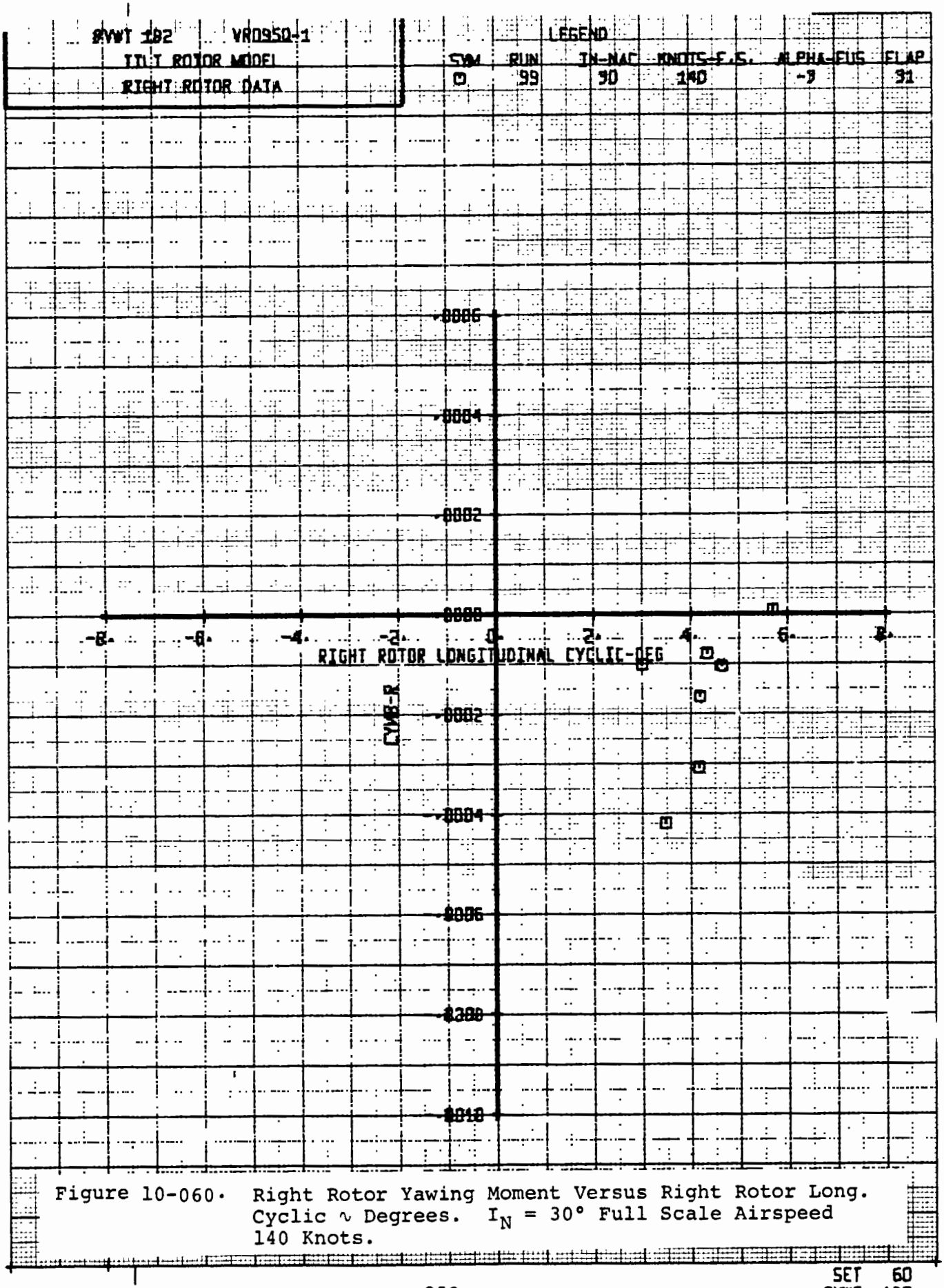
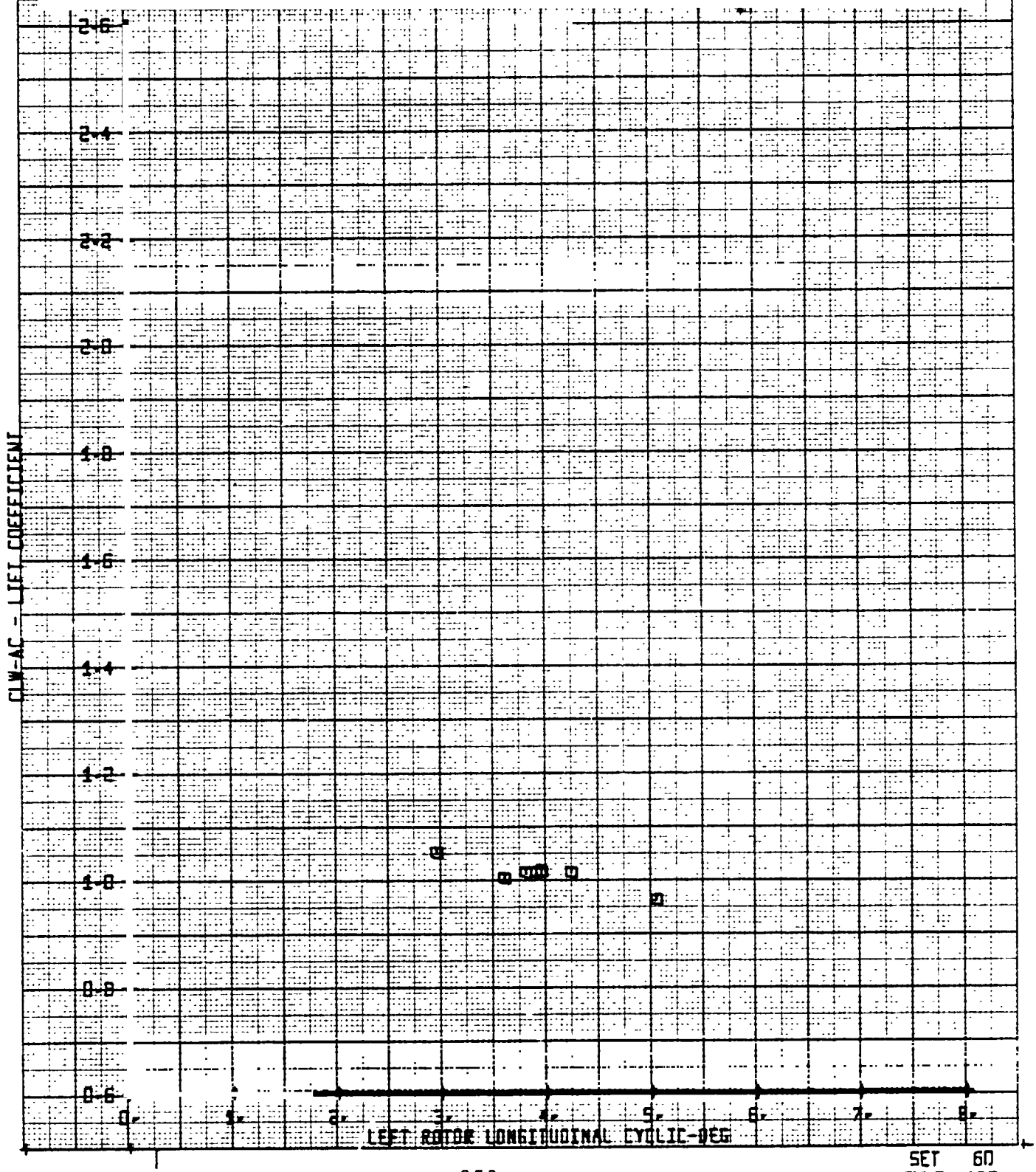


Figure 10-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0350-1
TILT ROTOR MODEL

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	99	30	140	-3	31

Figure 10-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



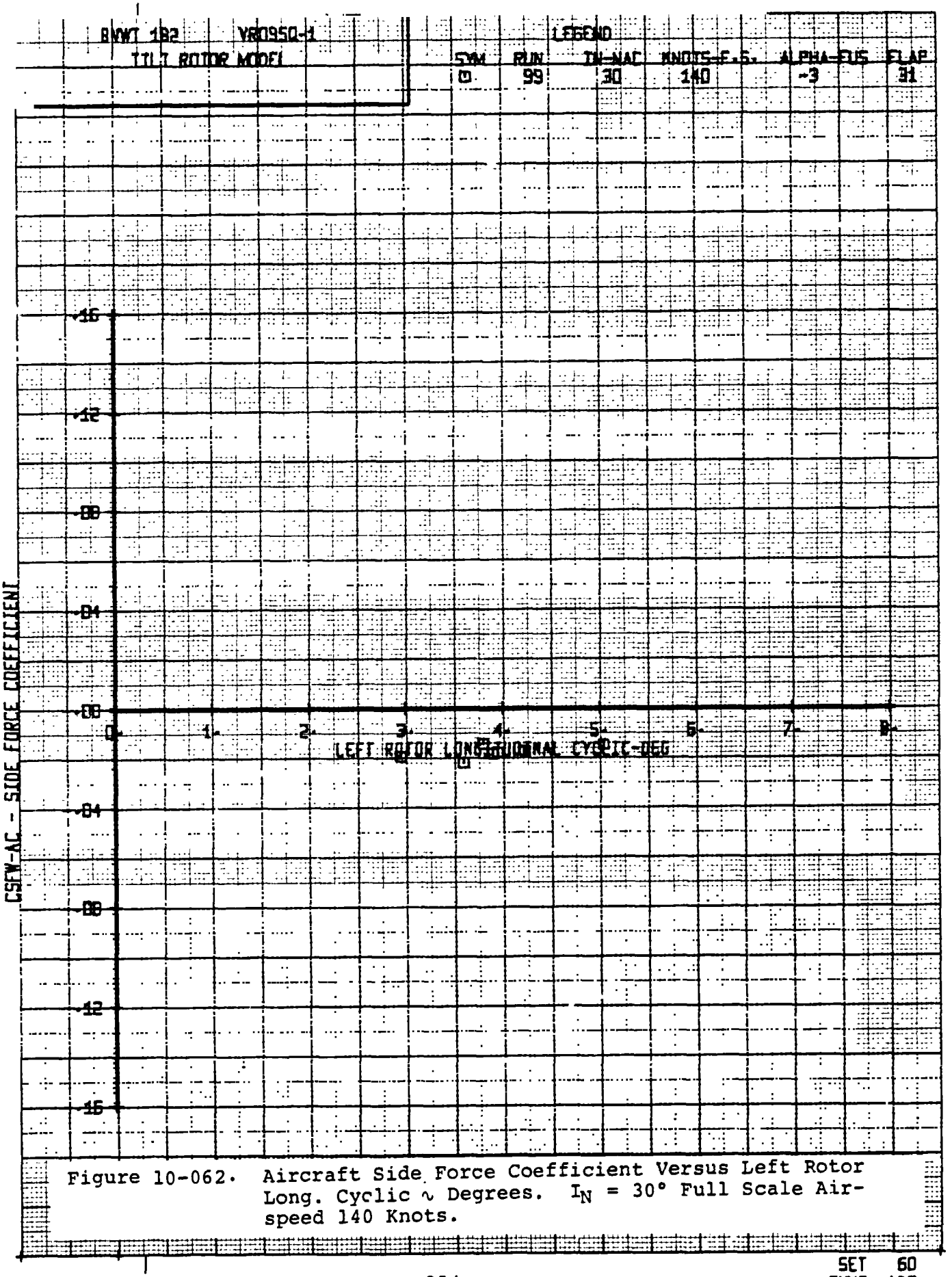


Figure 10-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

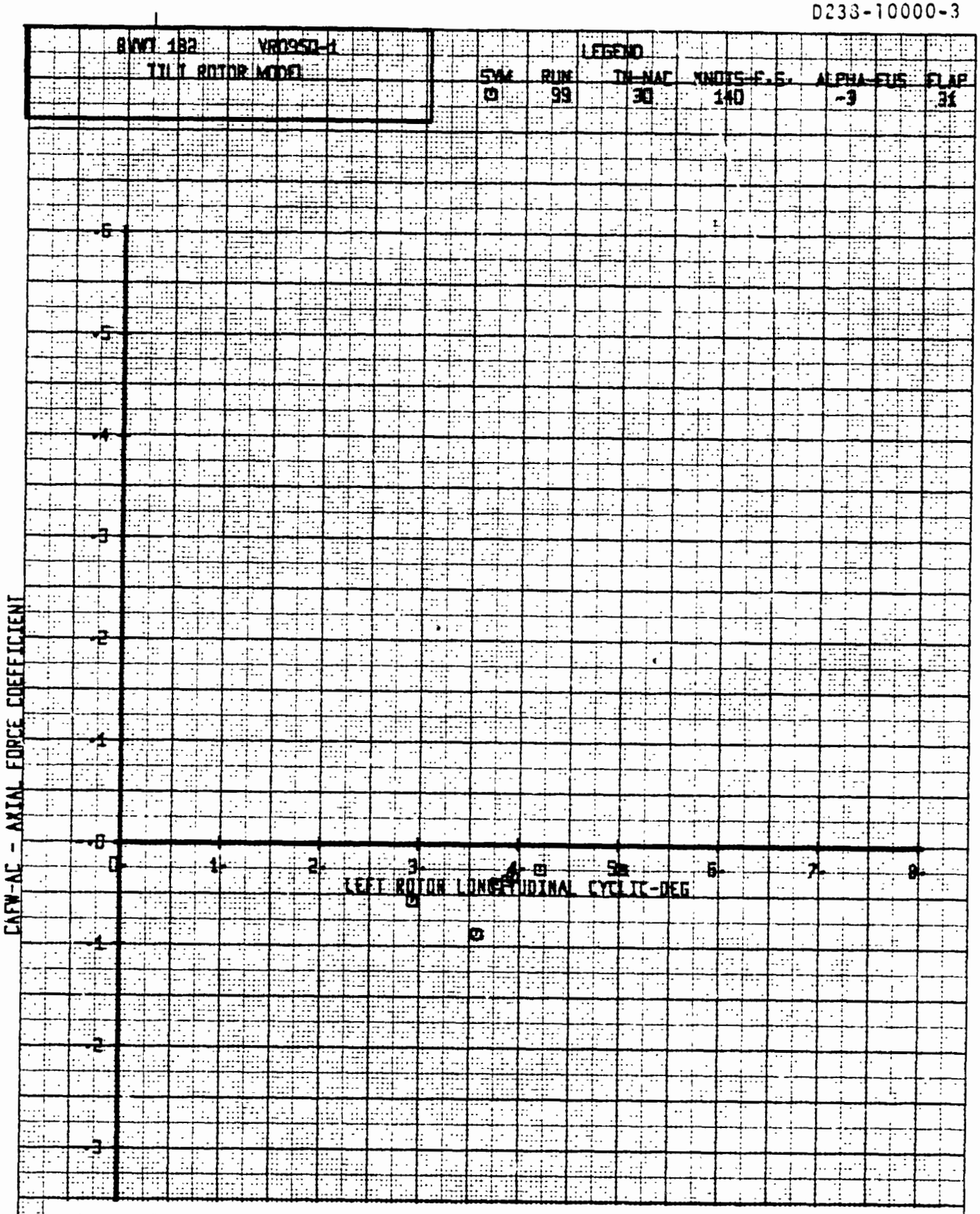


Figure 10-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

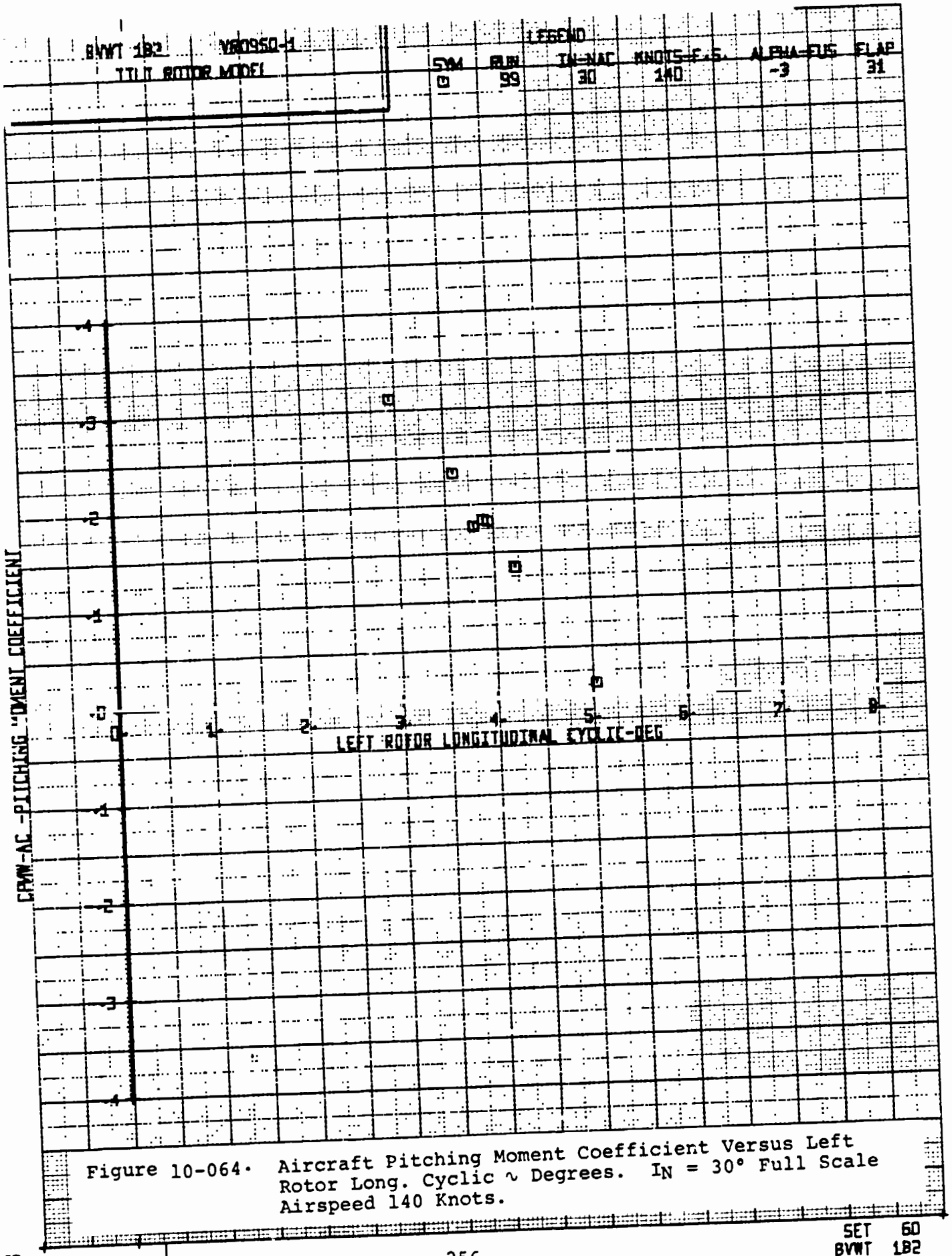


Figure 10-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

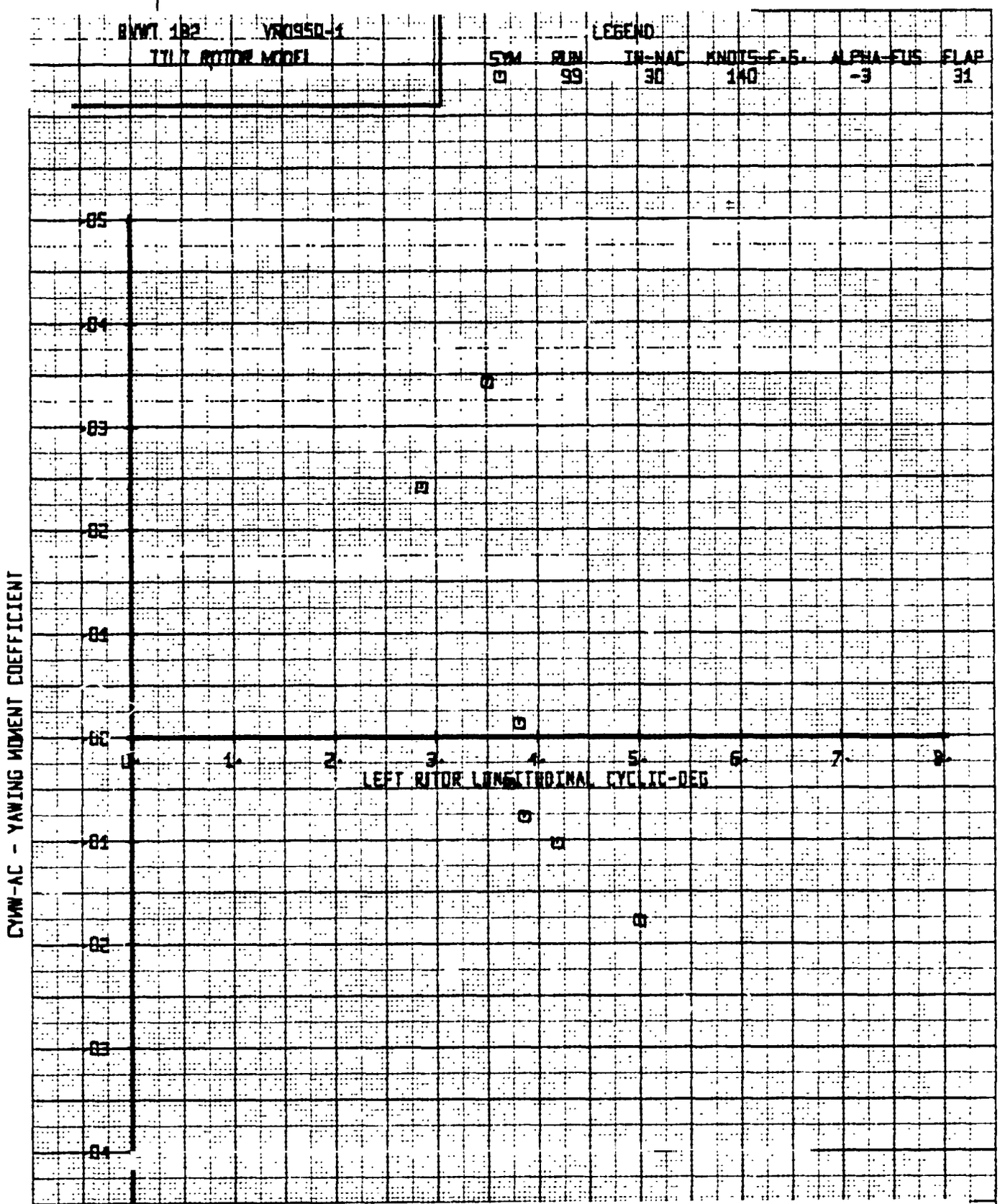


Figure 10-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. IN = 30° Full Scale Airspeed 140 Knots.

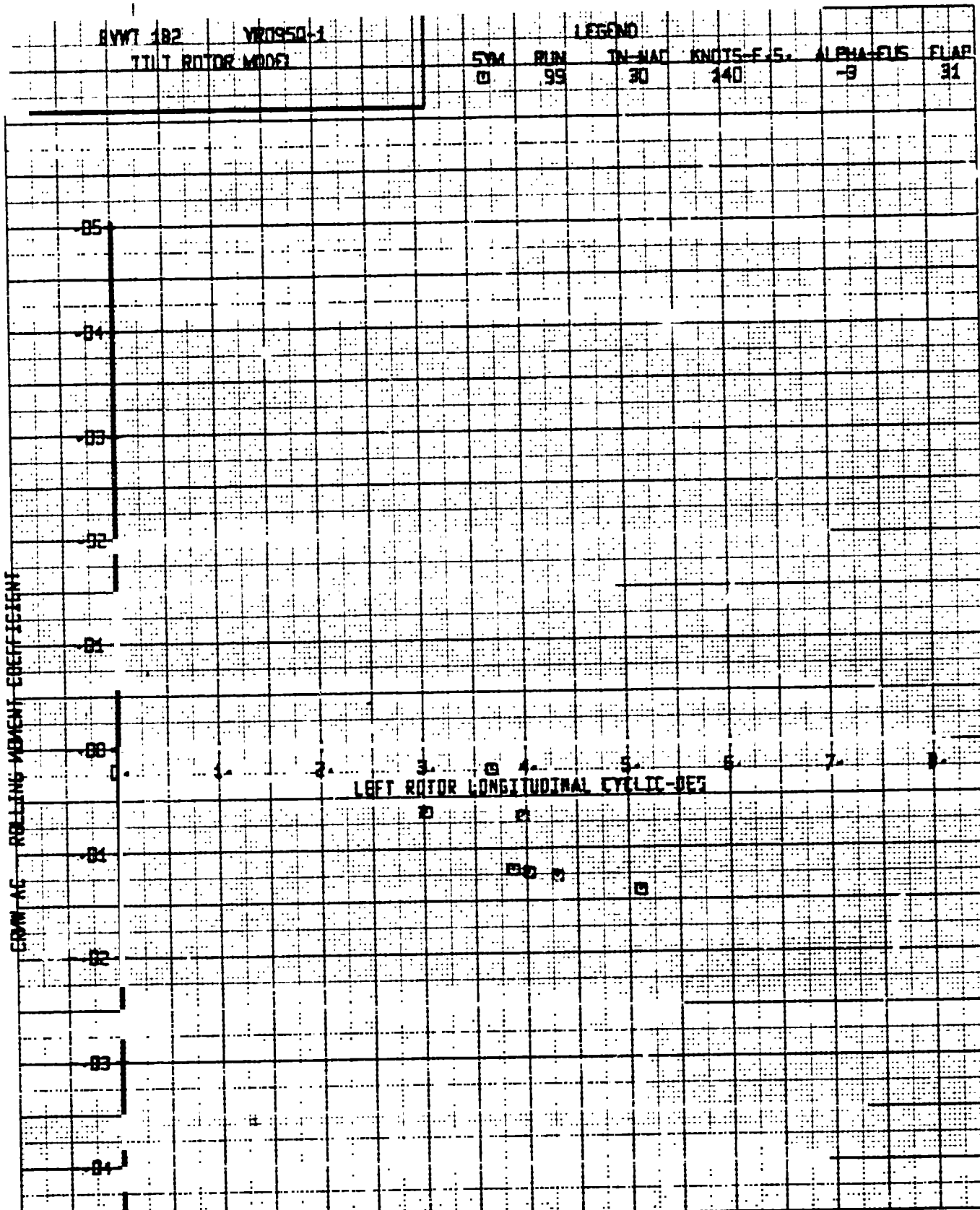


Figure 10-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

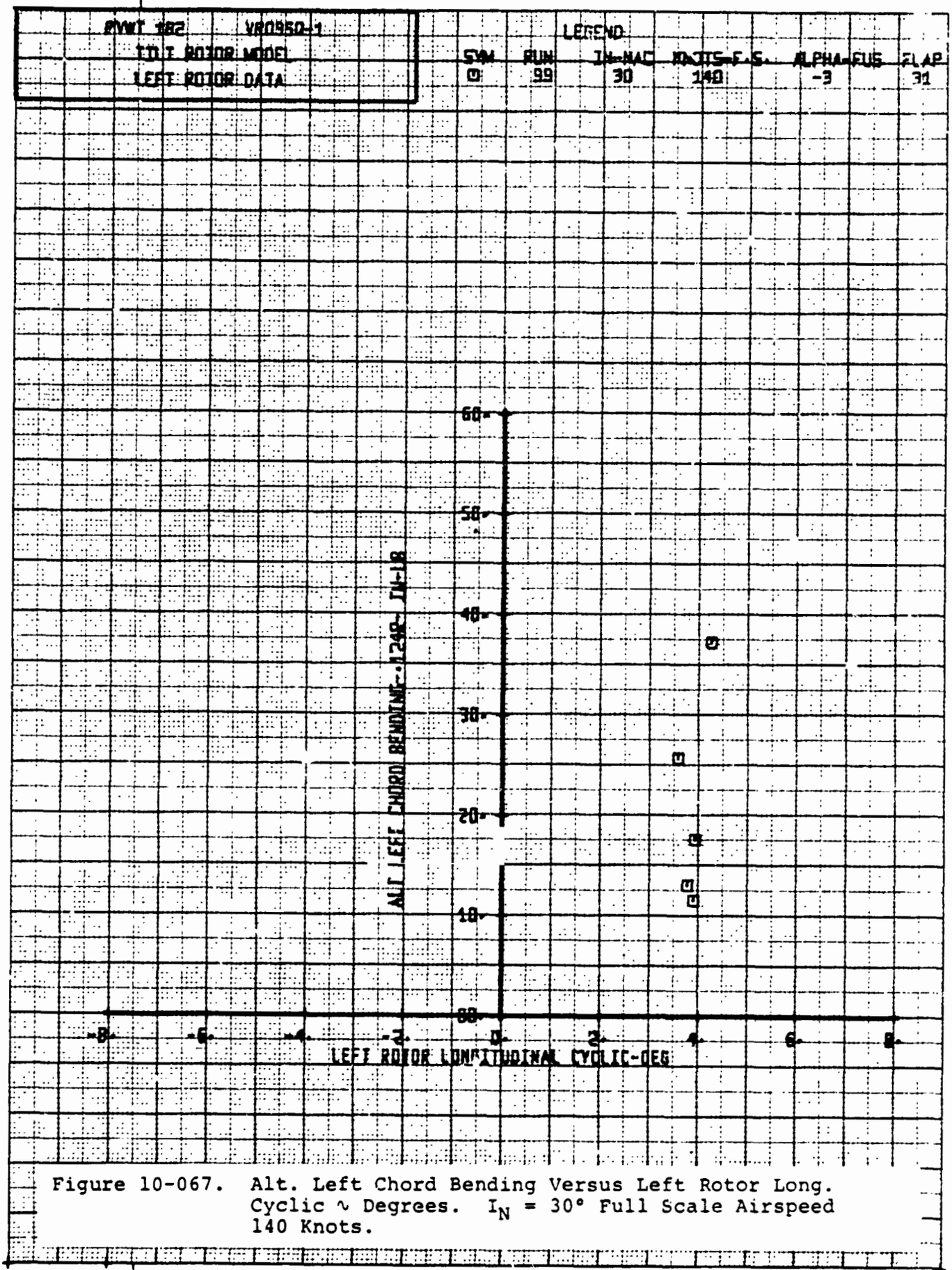


Figure 10-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

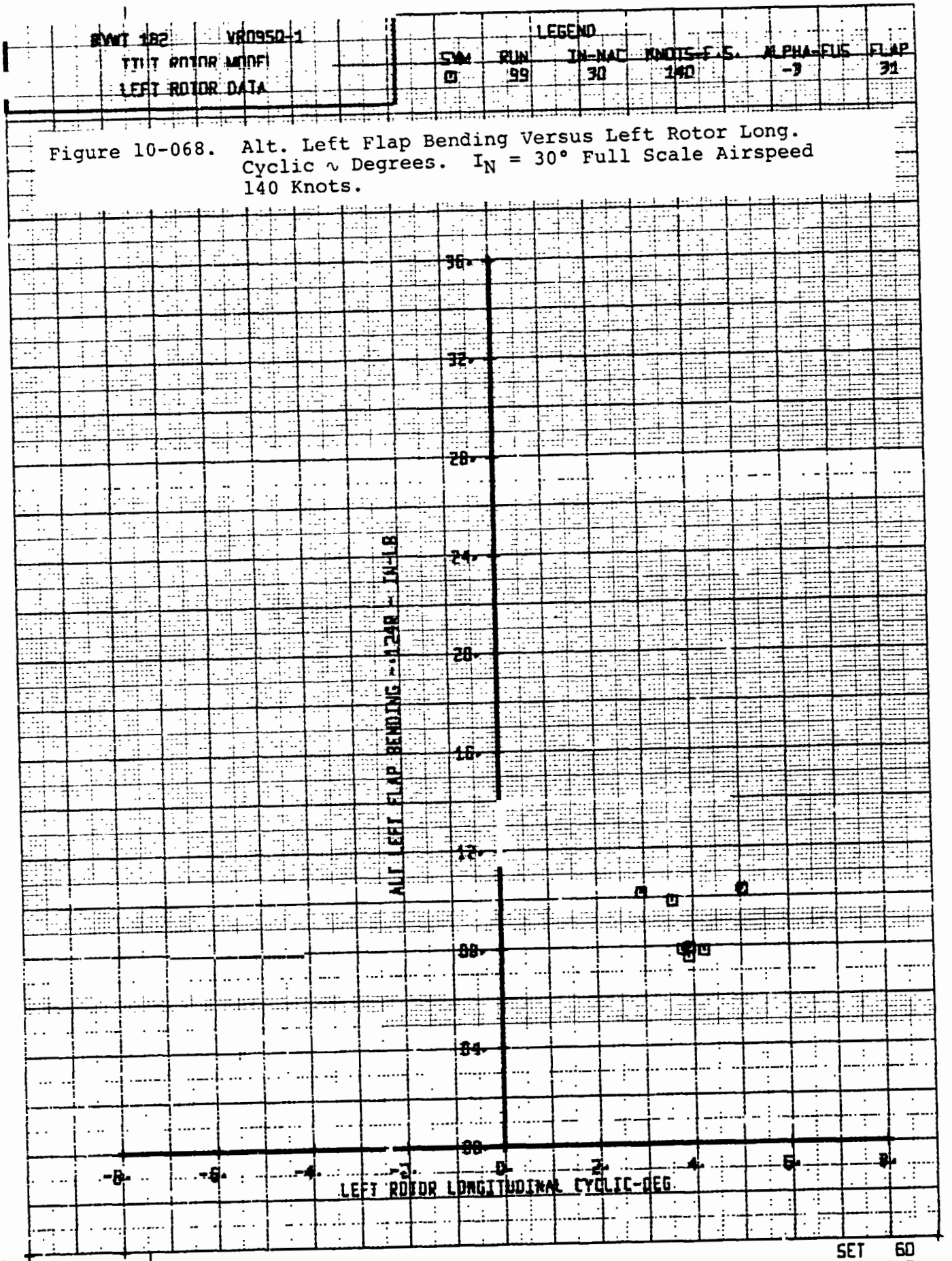
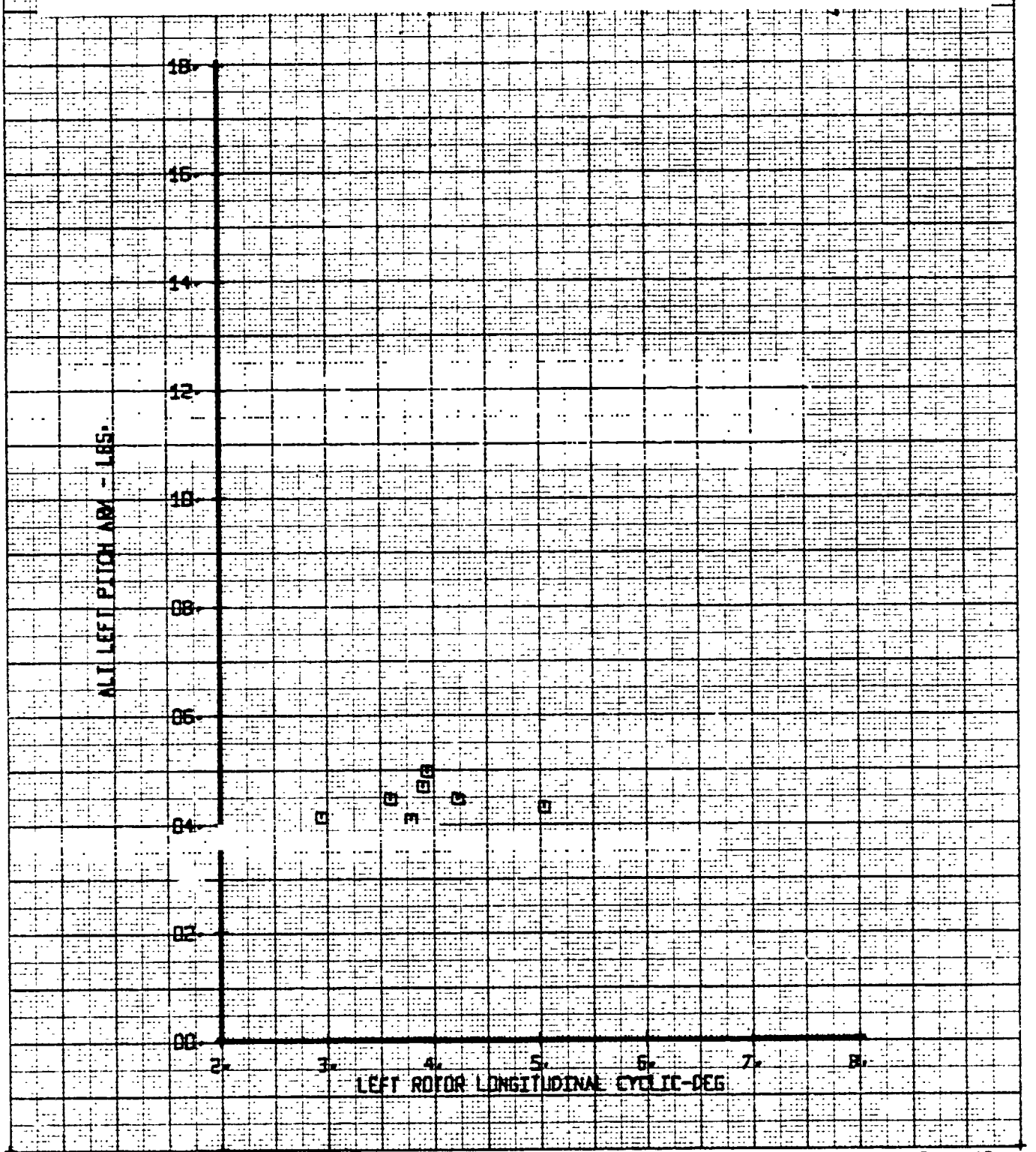


Figure 10-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VRD950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	99	30	140	-3	31

Figure 10-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



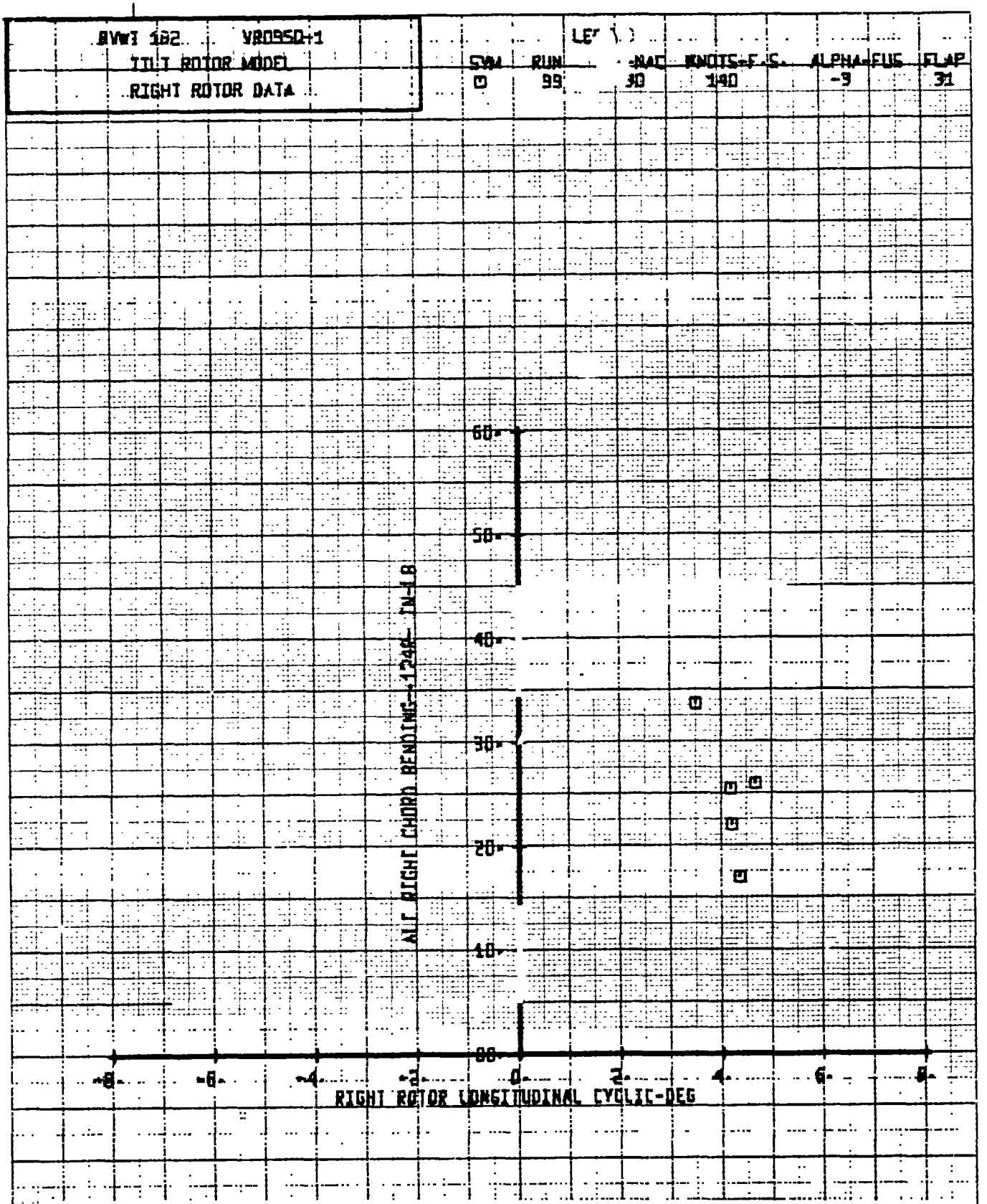


Figure 10-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

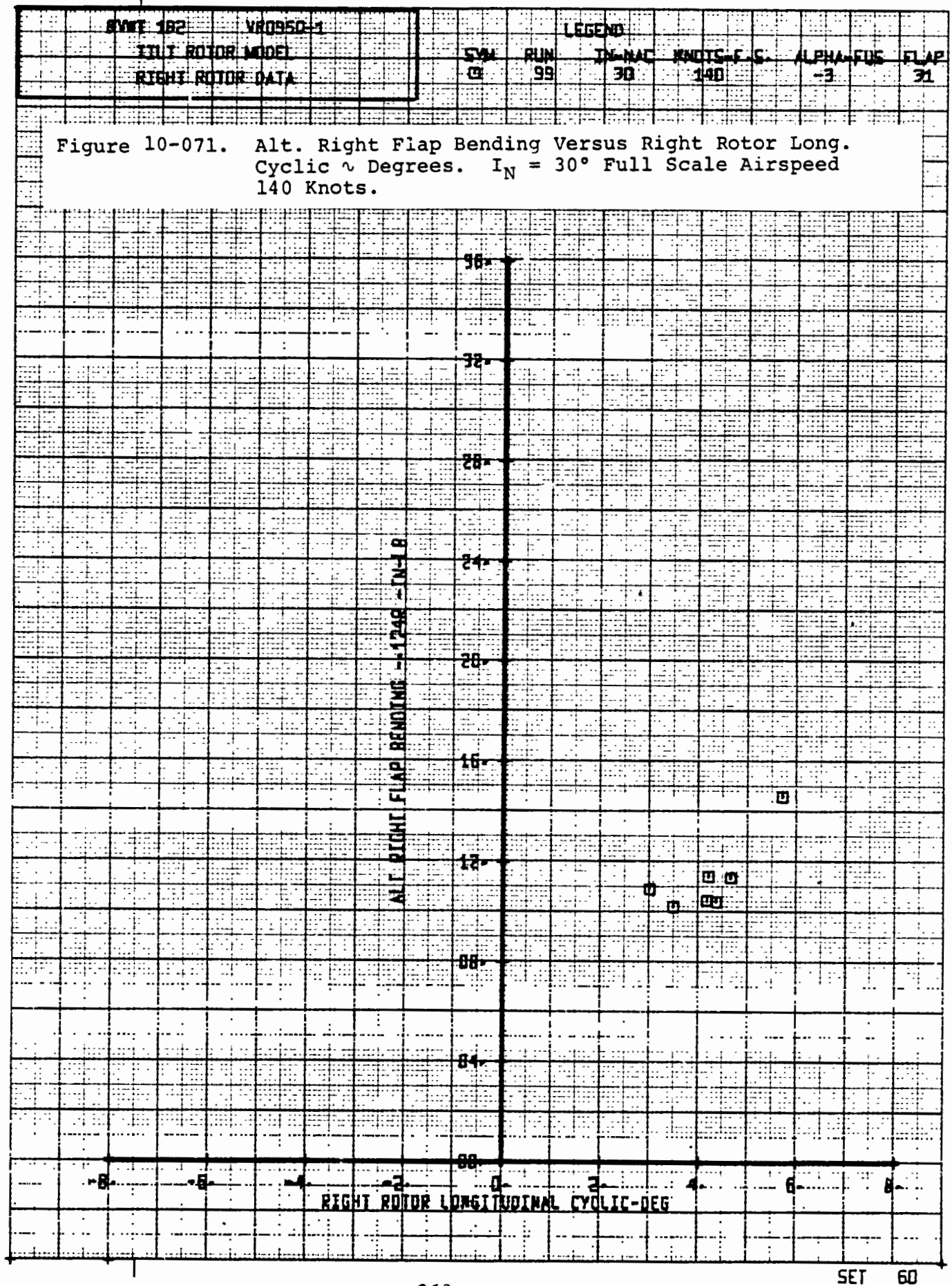


Figure 10-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

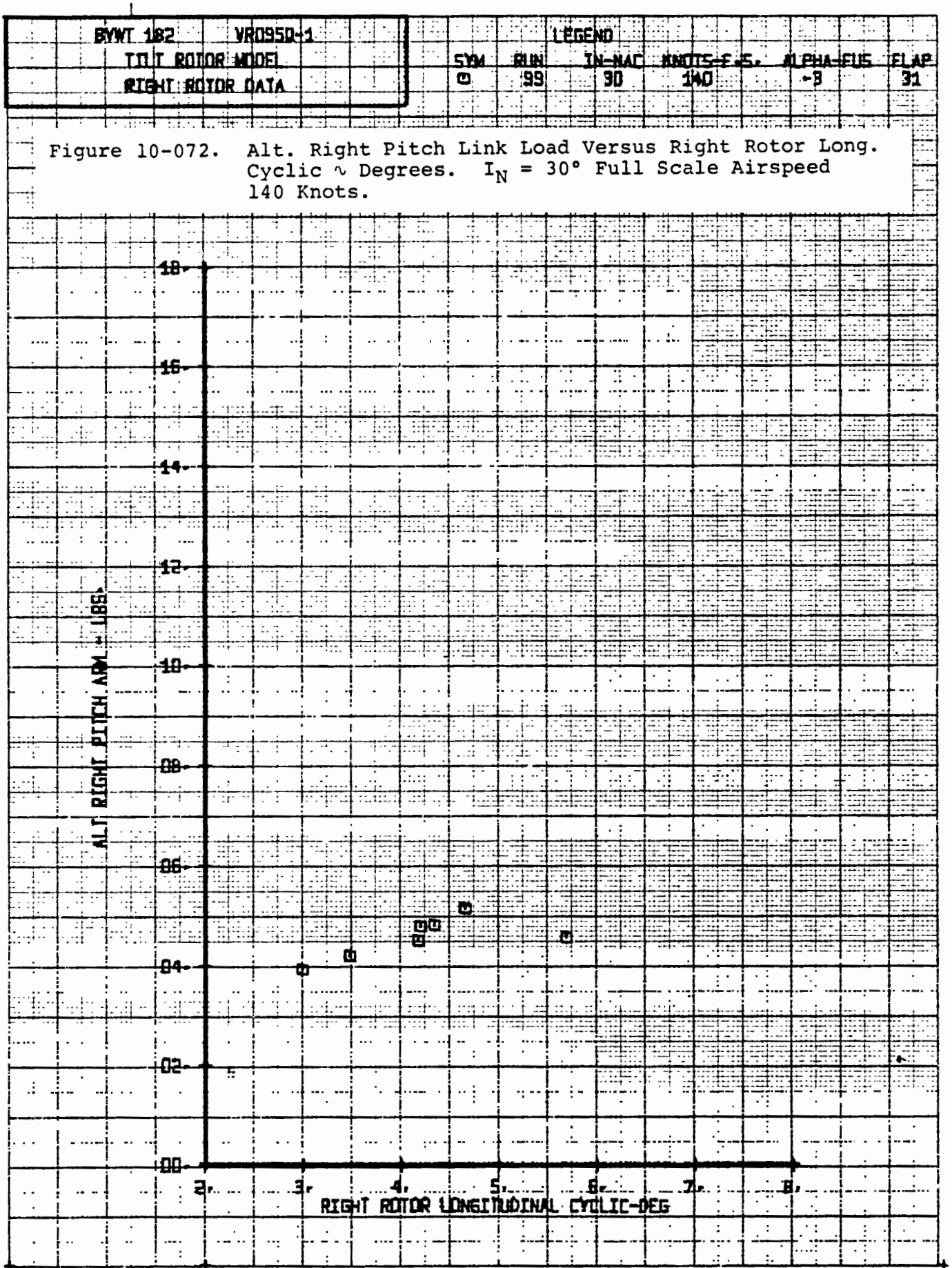


Figure 10-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

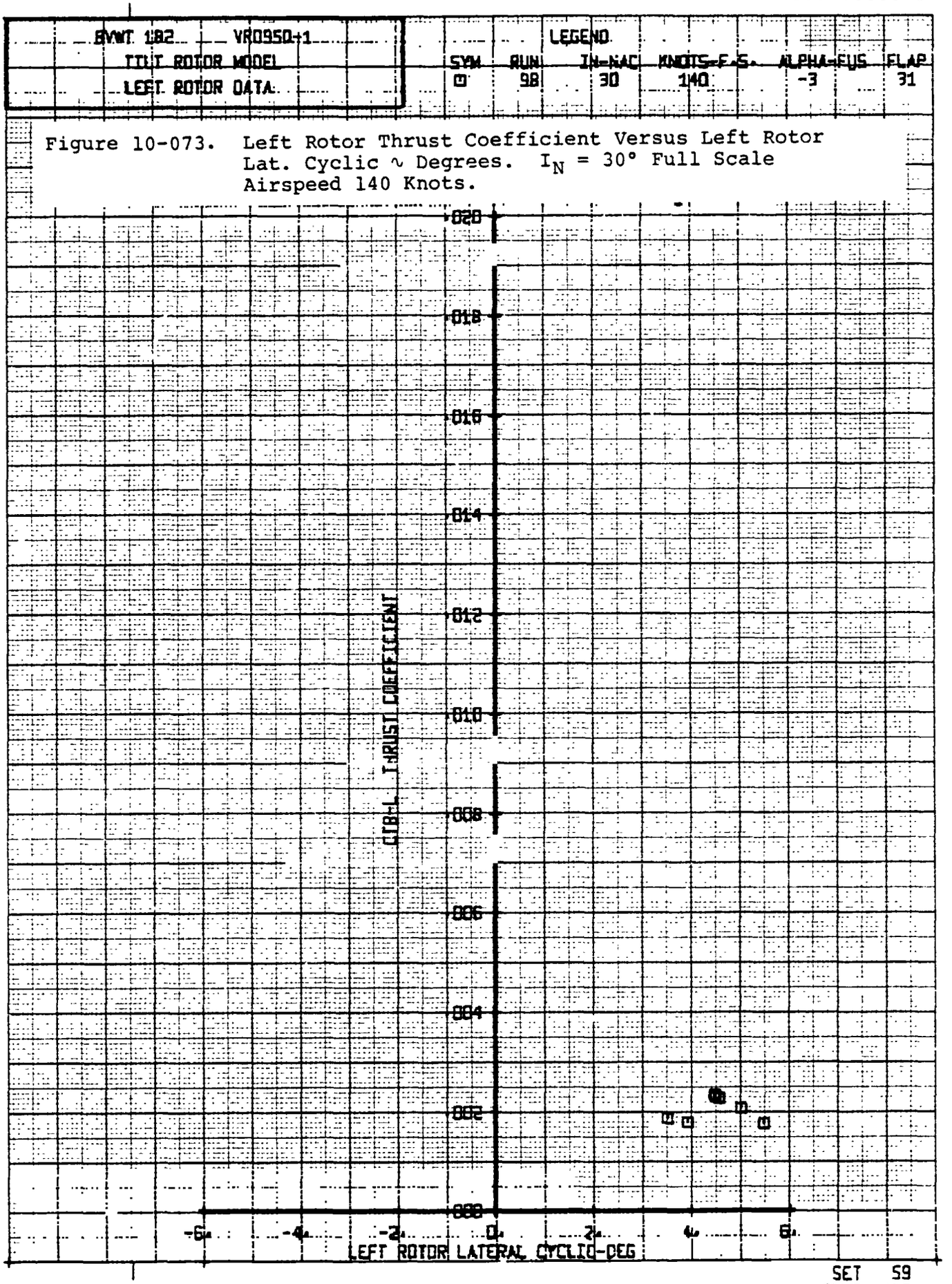


Figure 10-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

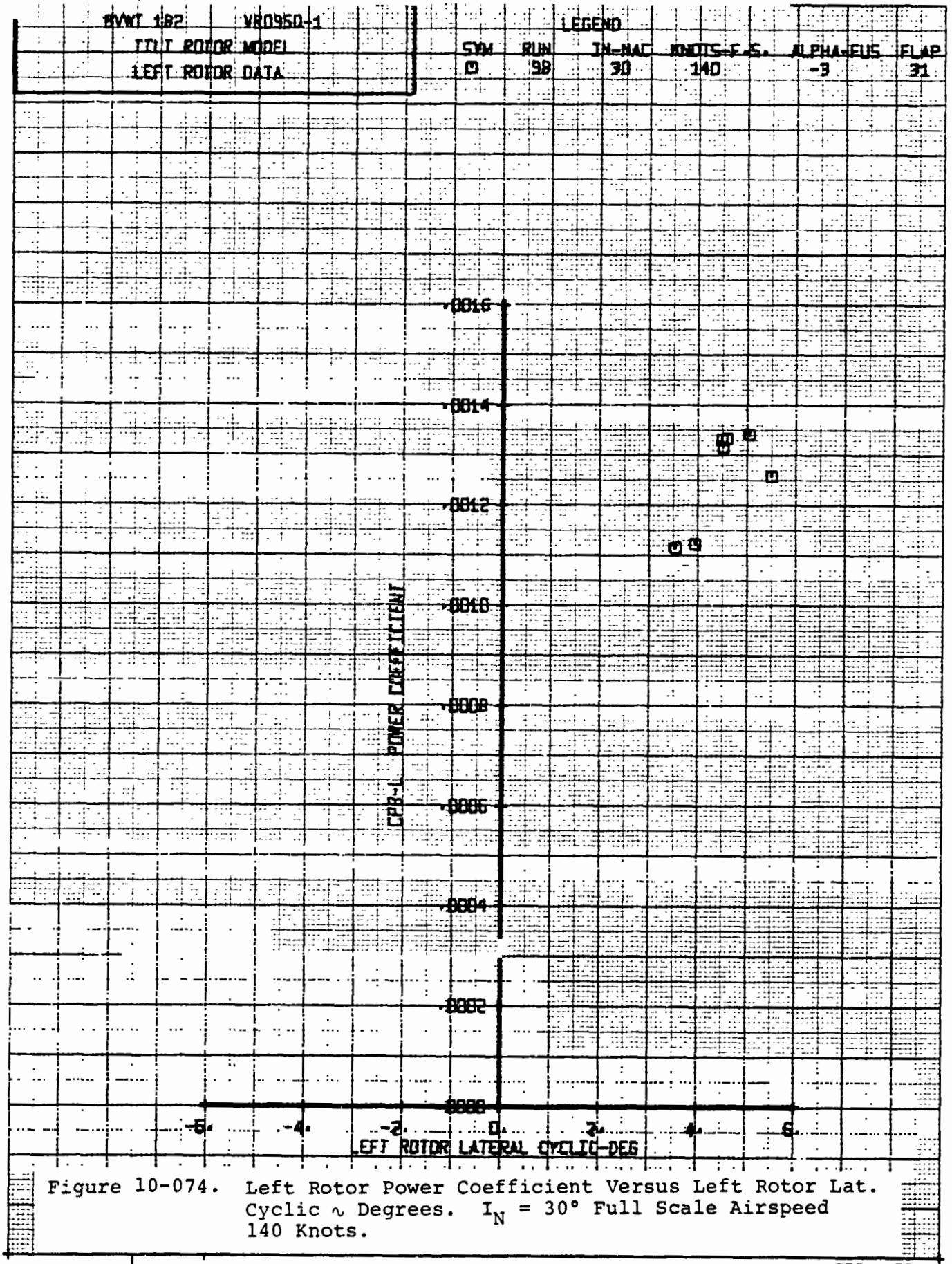


Figure 10-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

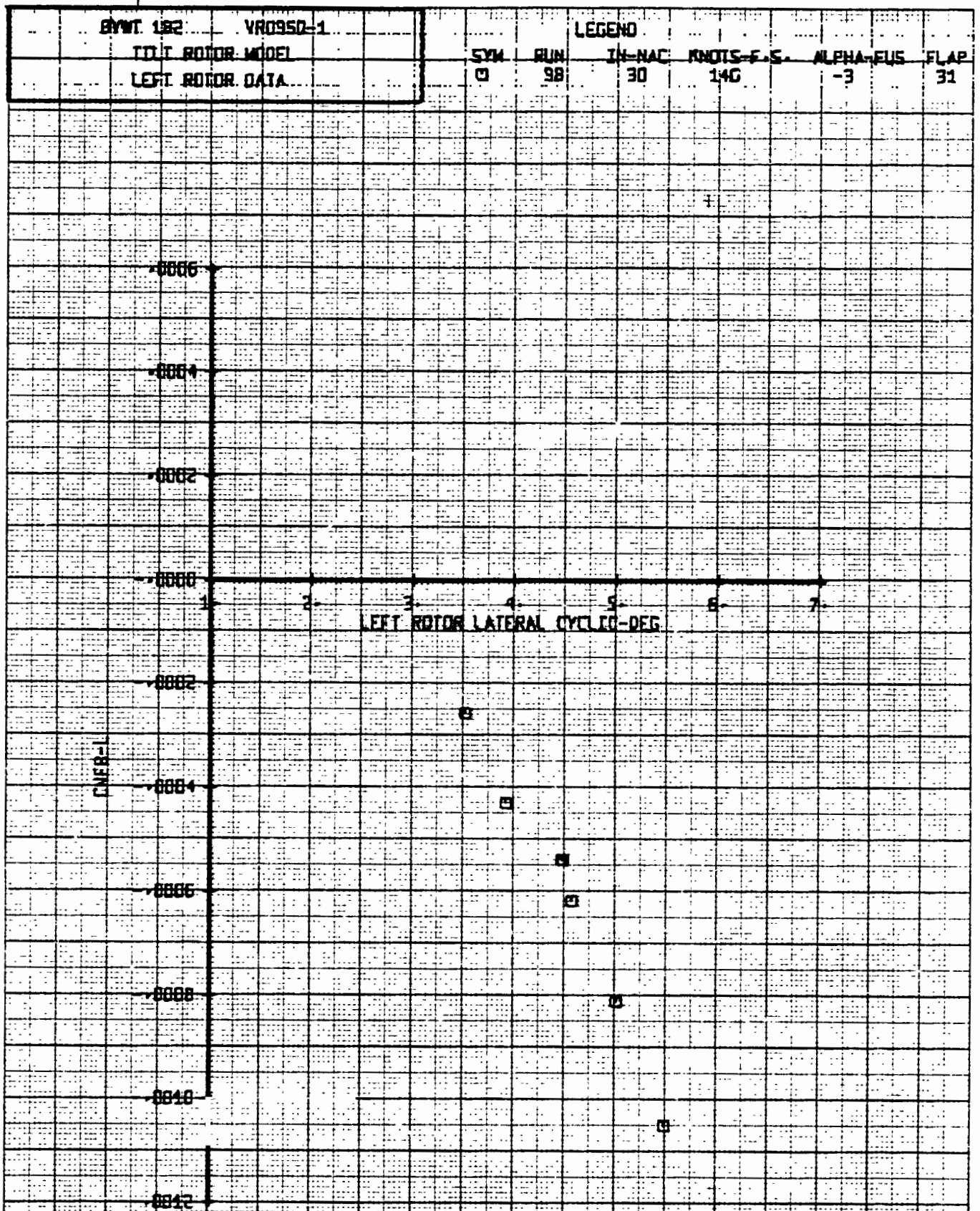


Figure 10-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

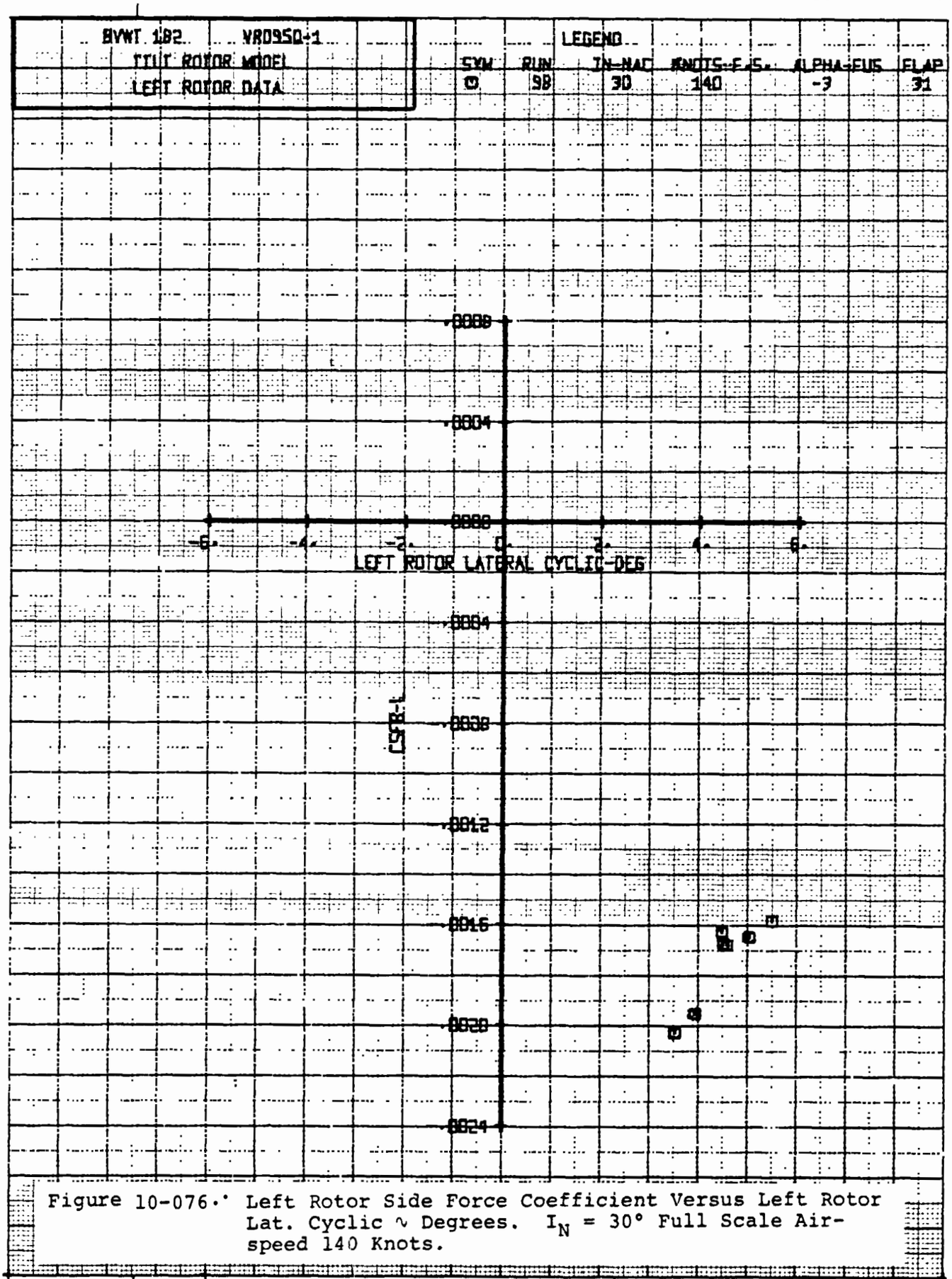


Figure 10-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

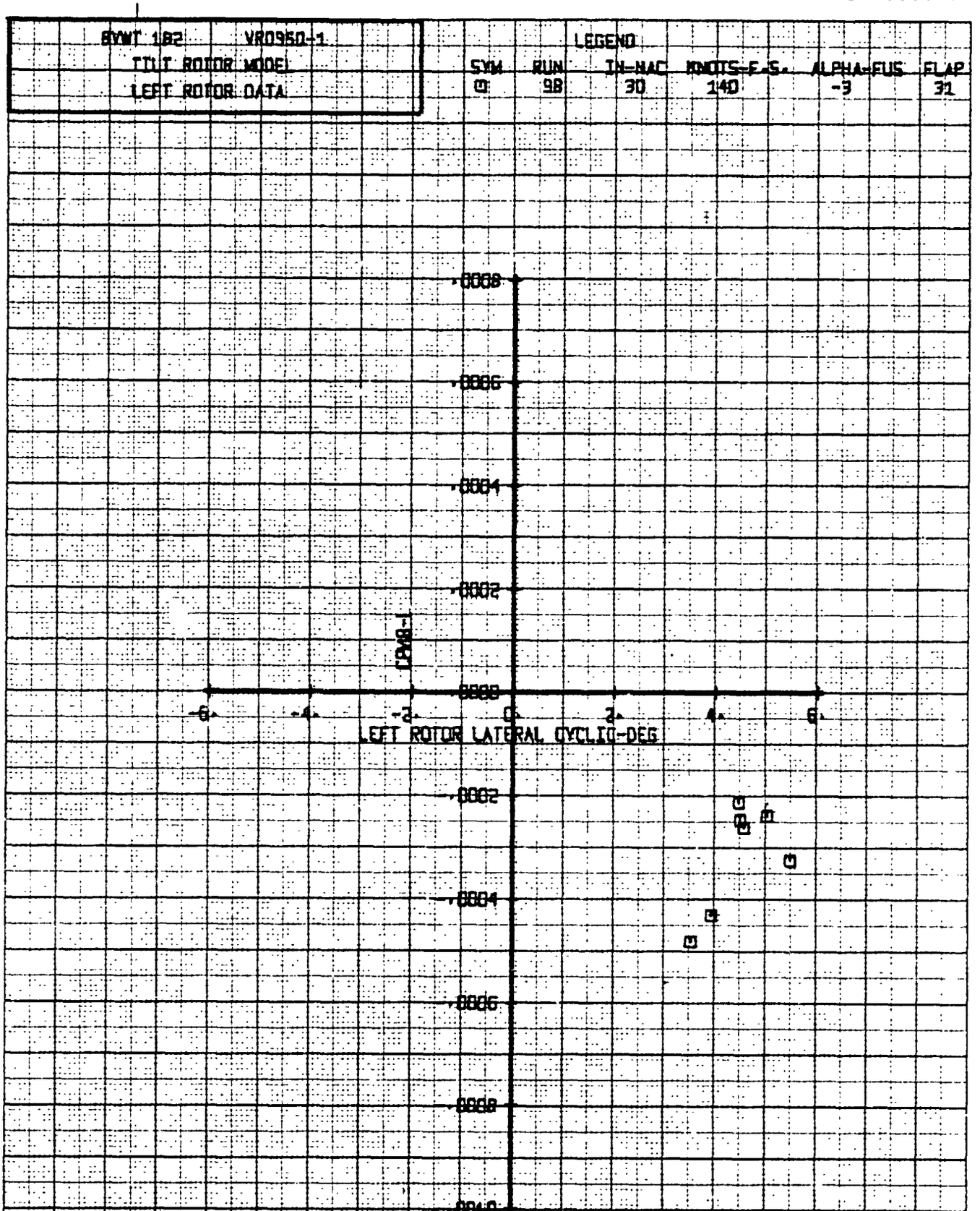


Figure 10-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

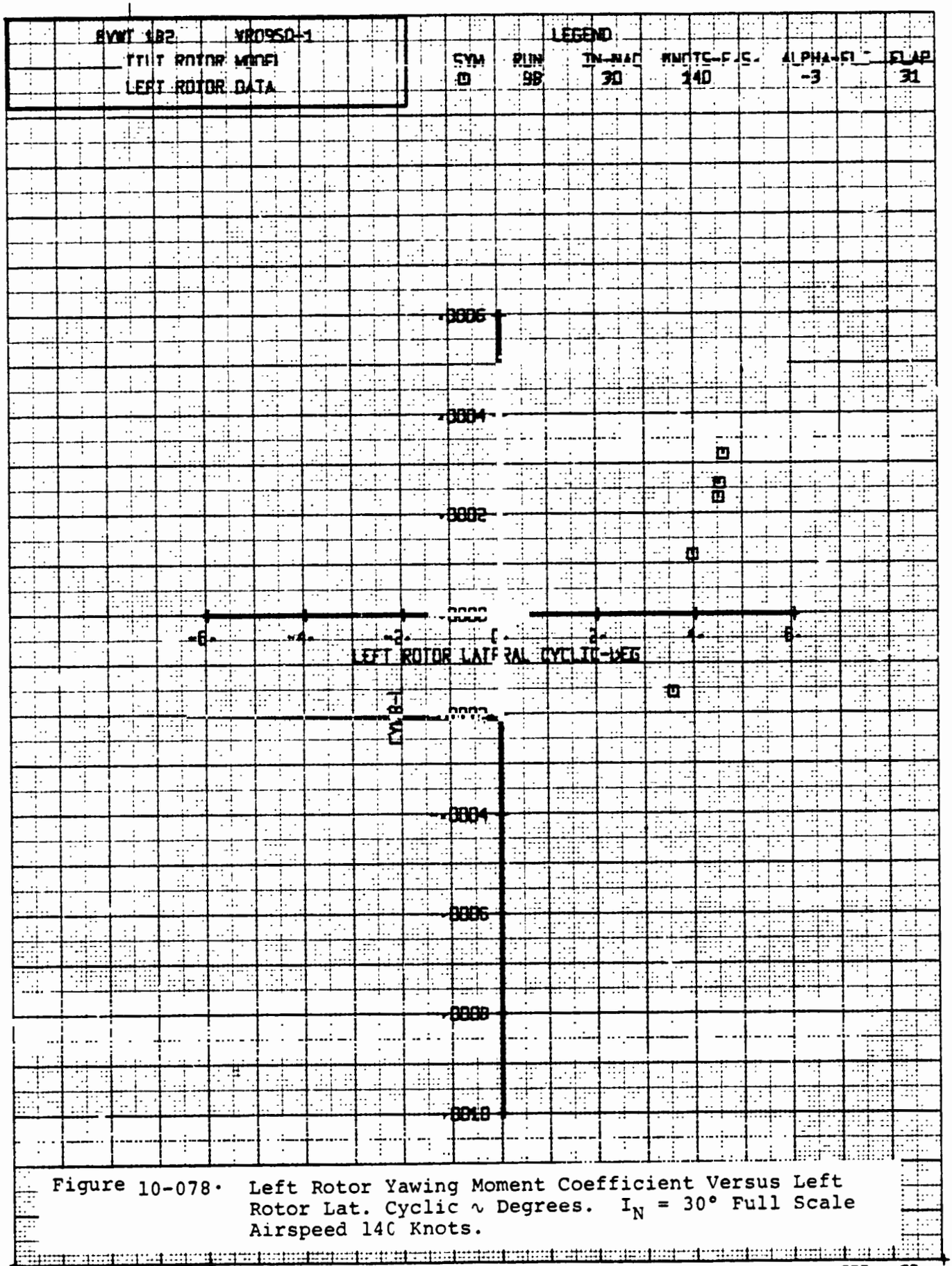


Figure 10-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

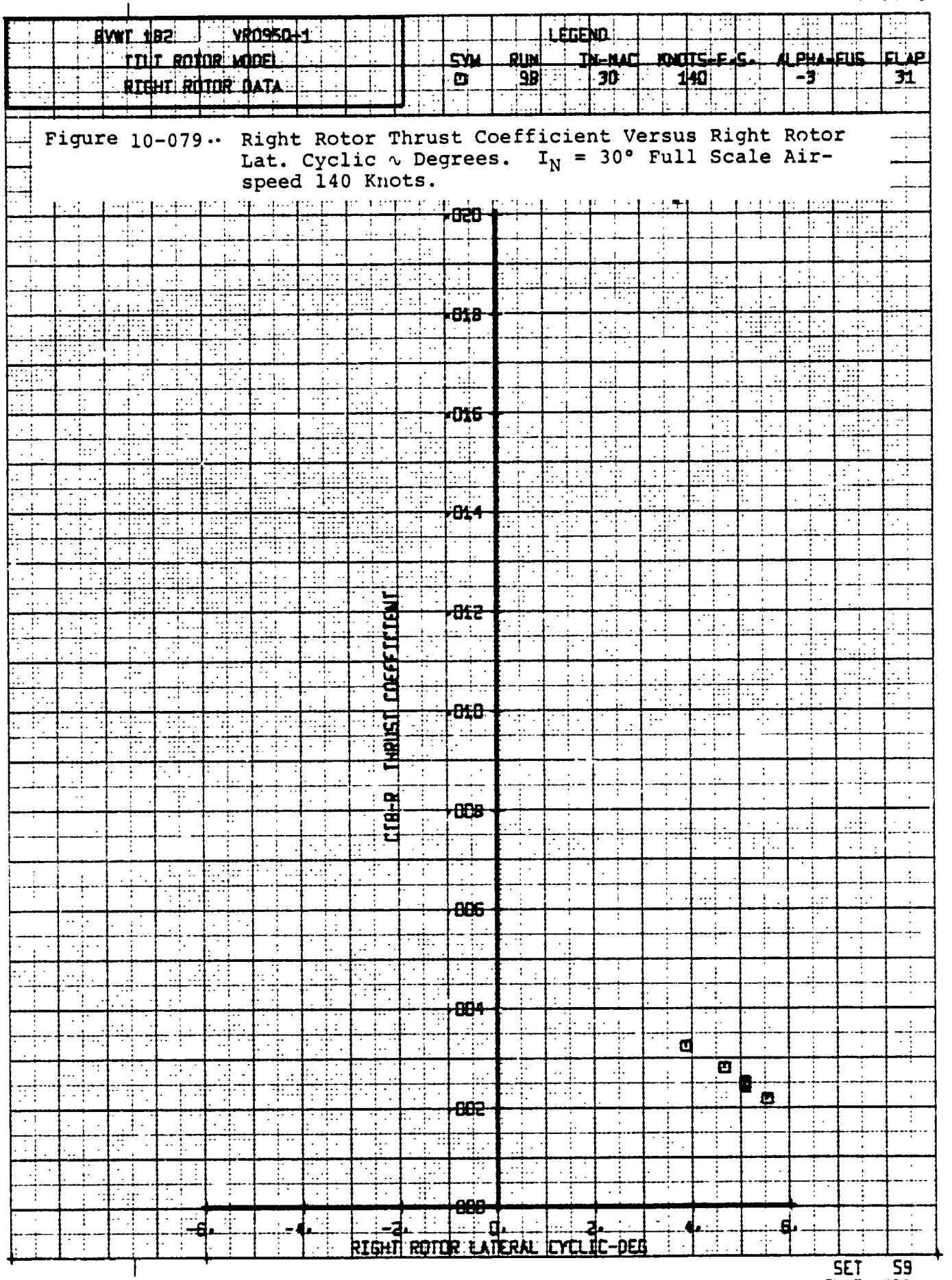


Figure 10-079.. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

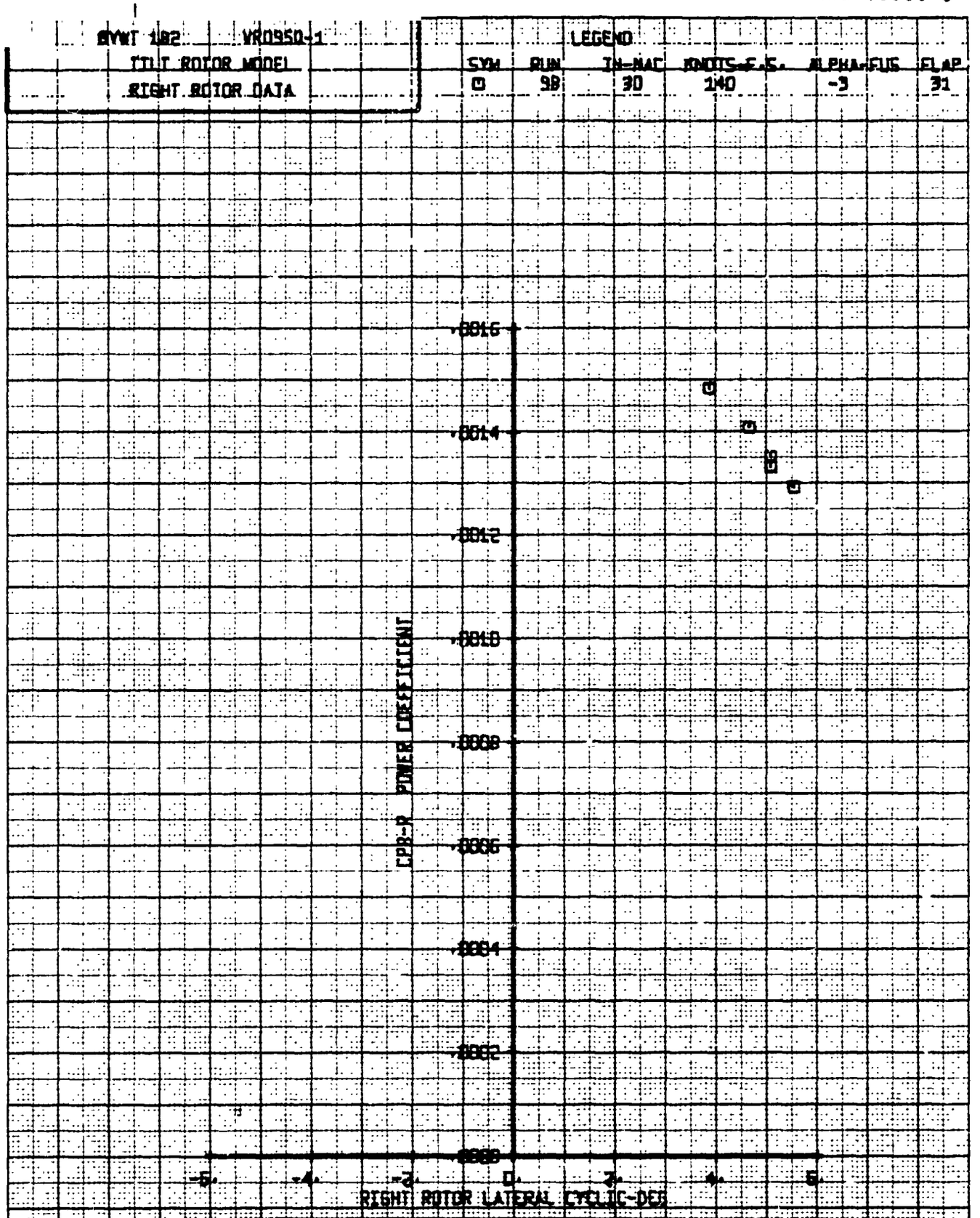


Figure 10-080. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

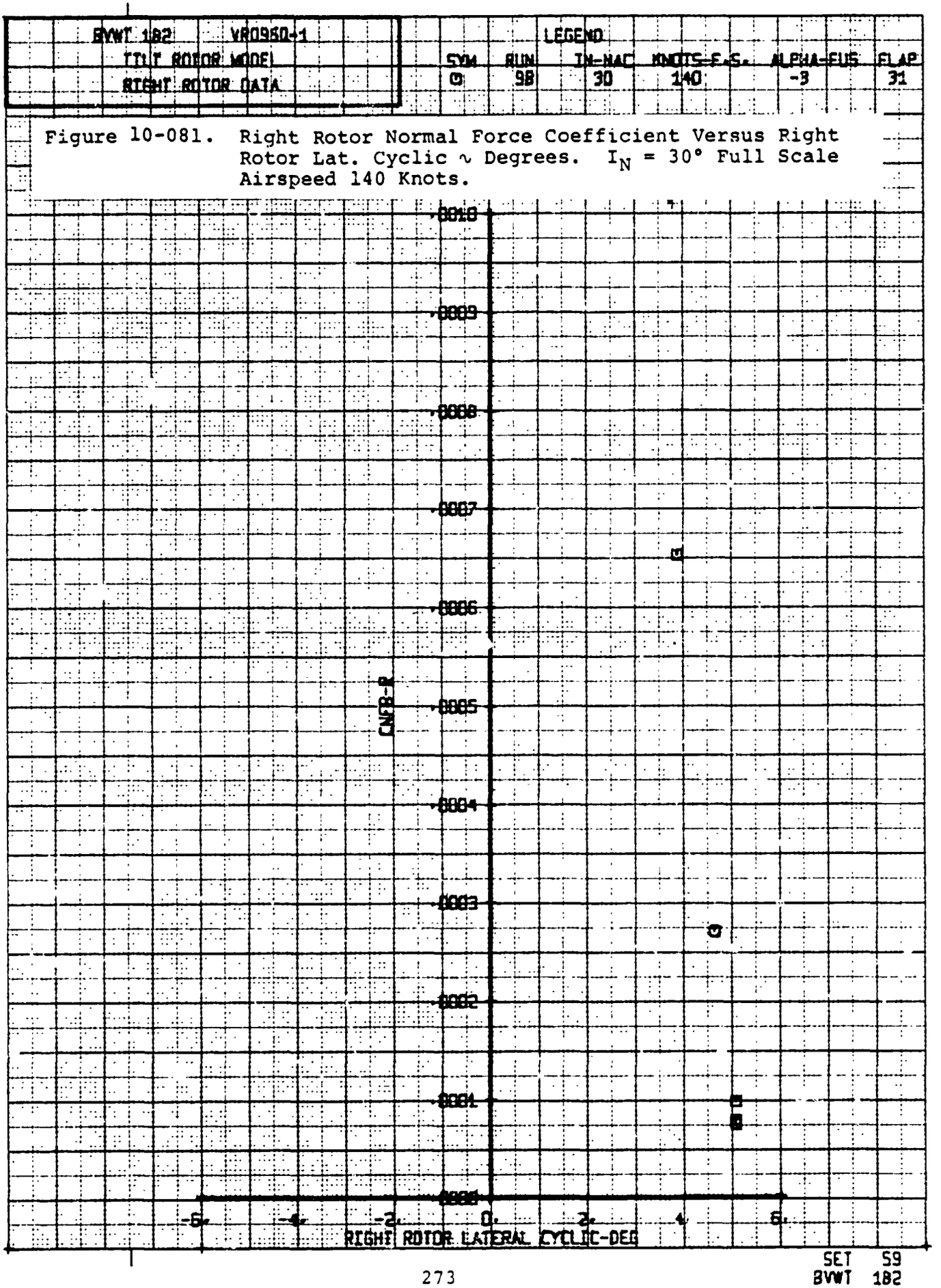


Figure 10-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

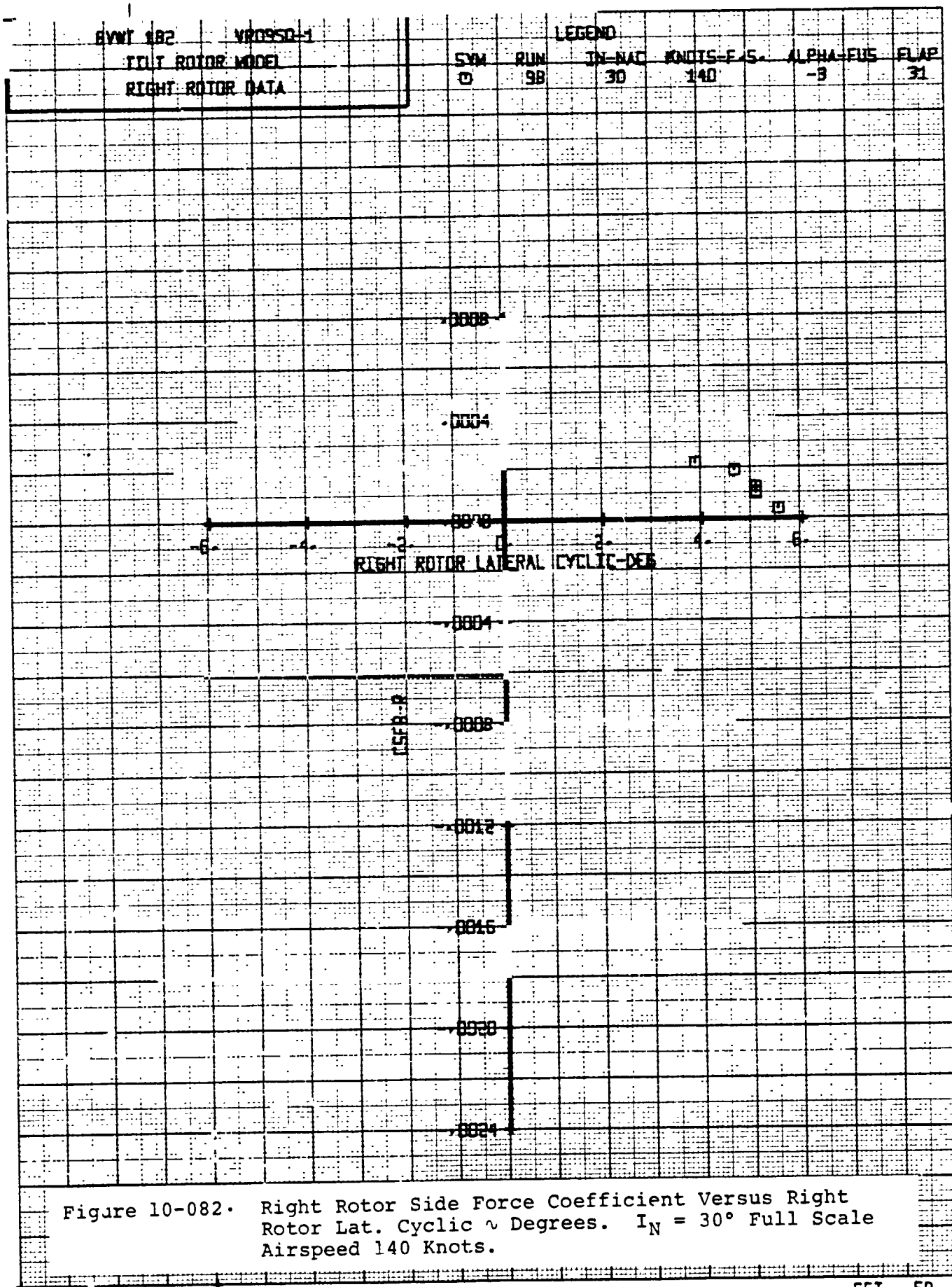


Figure 10-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

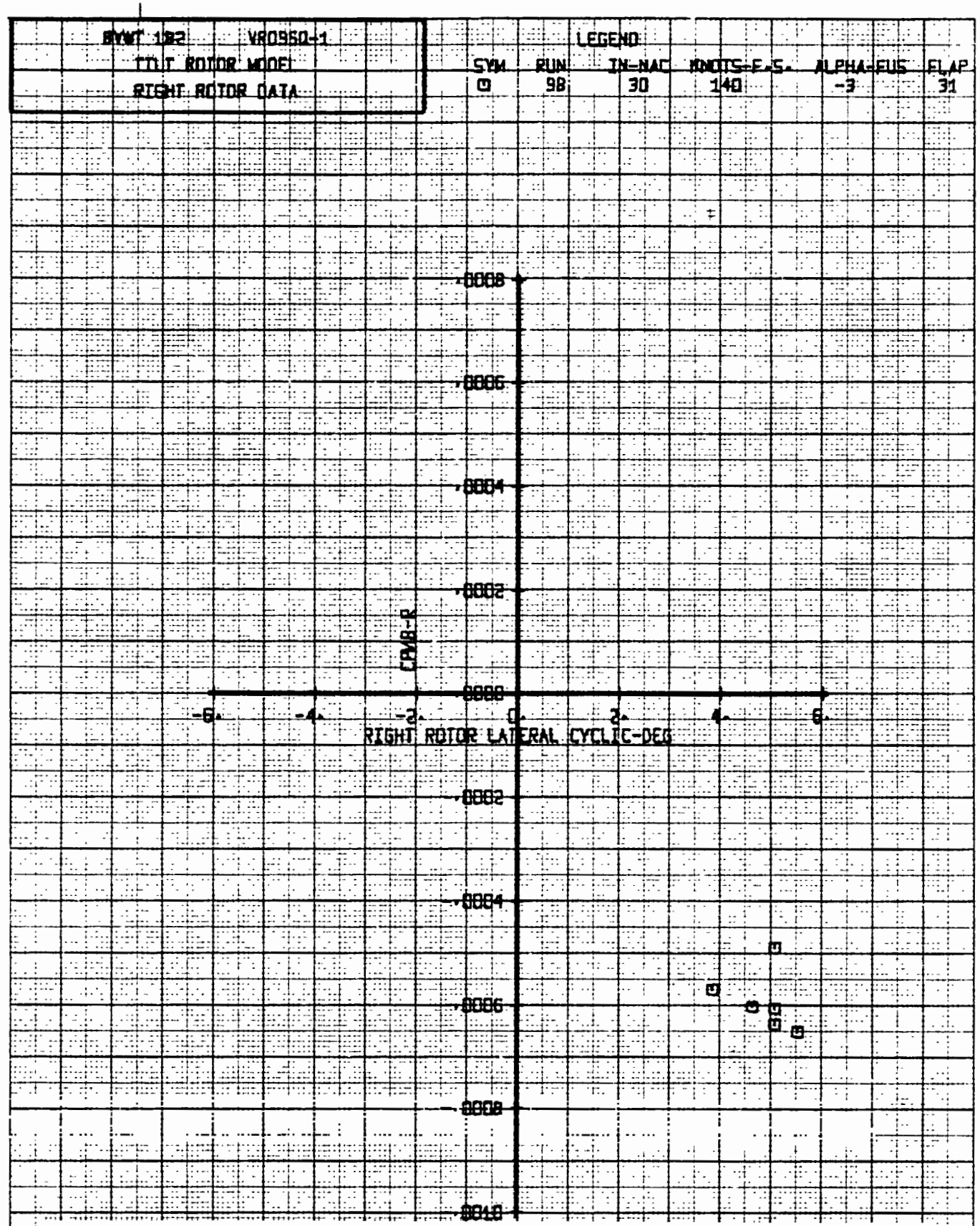


Figure 10-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees I_N = 30° Full Scale Airspeed 140 Knots.

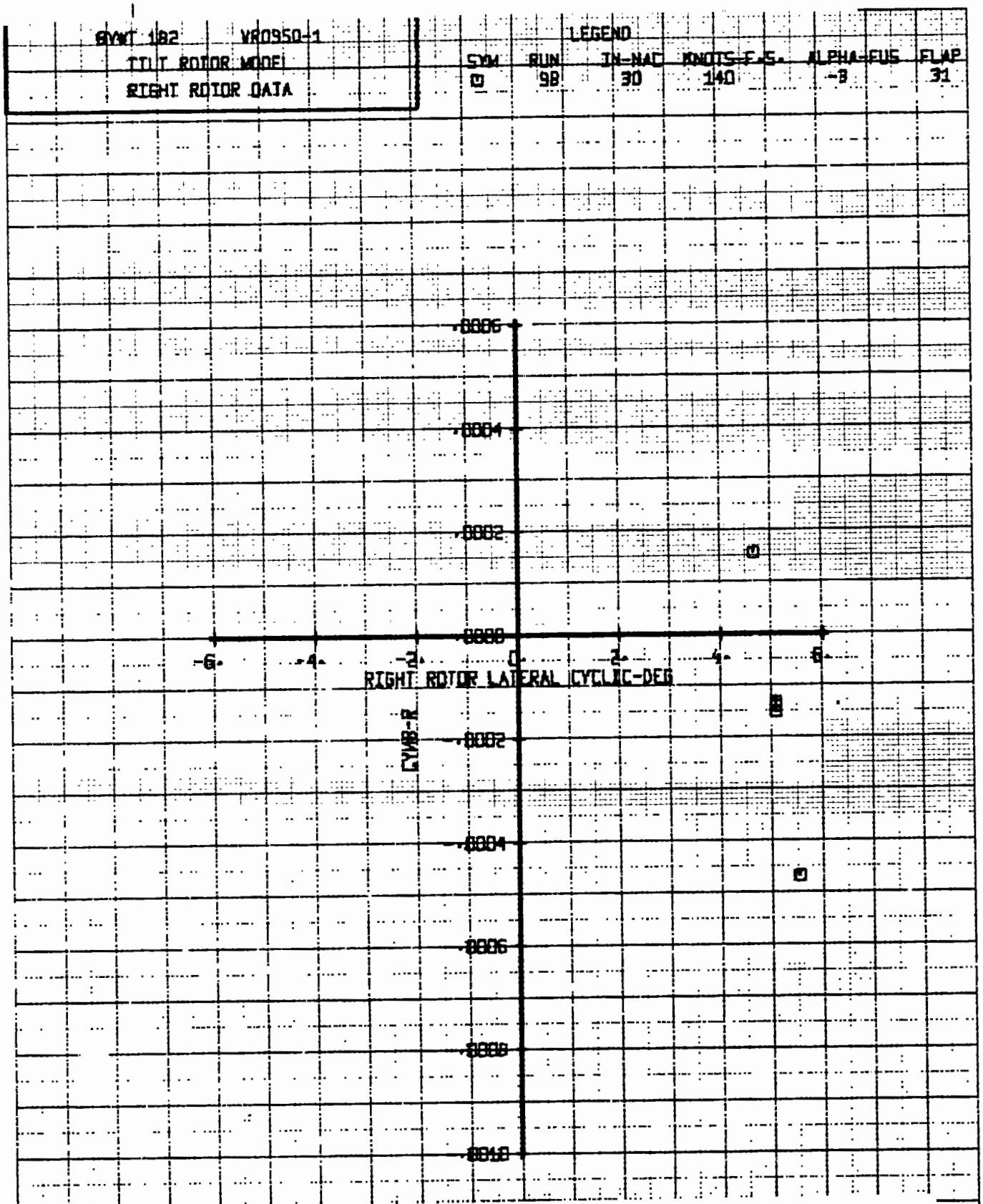


Figure 10-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

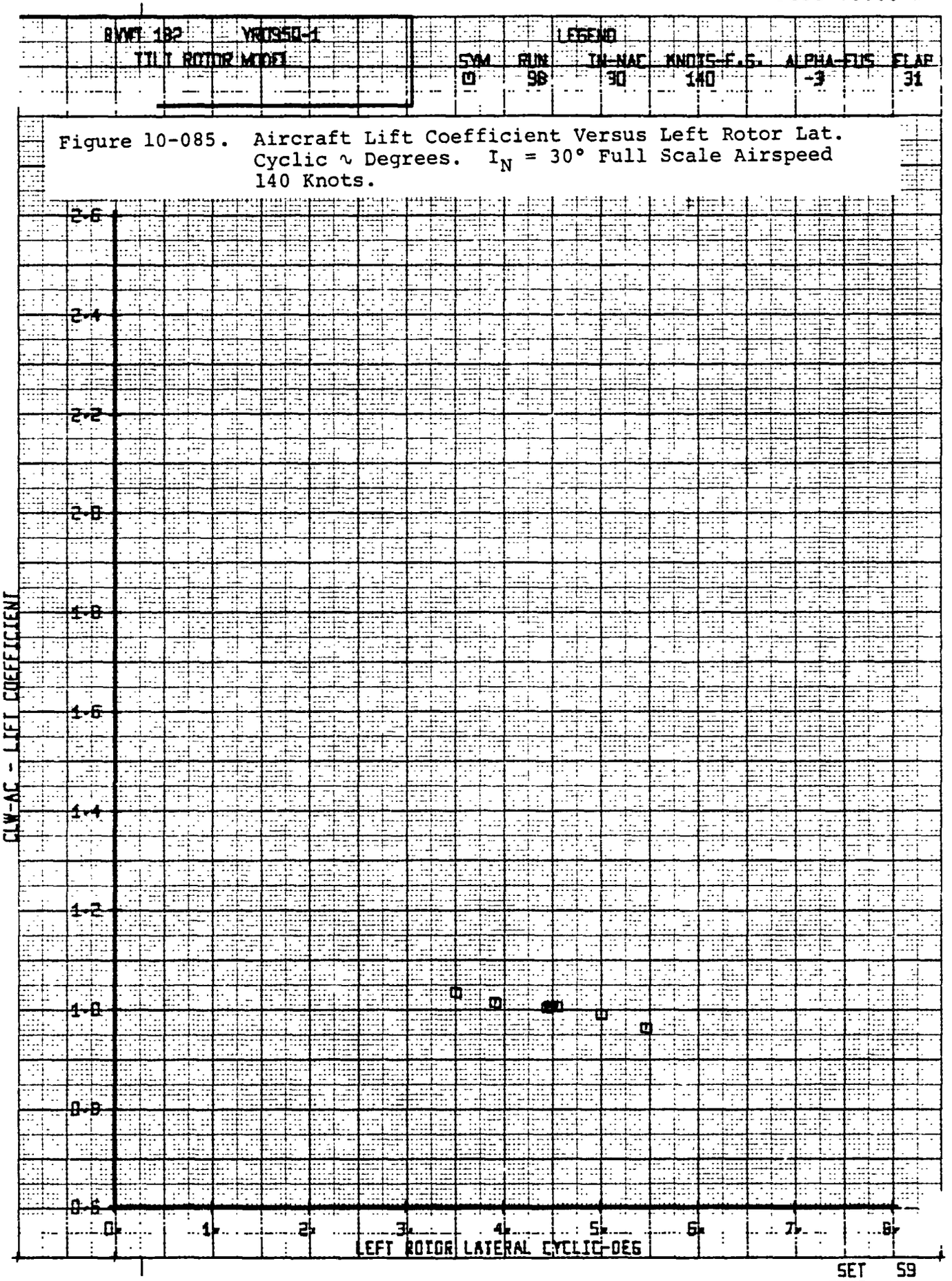


Figure 10-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

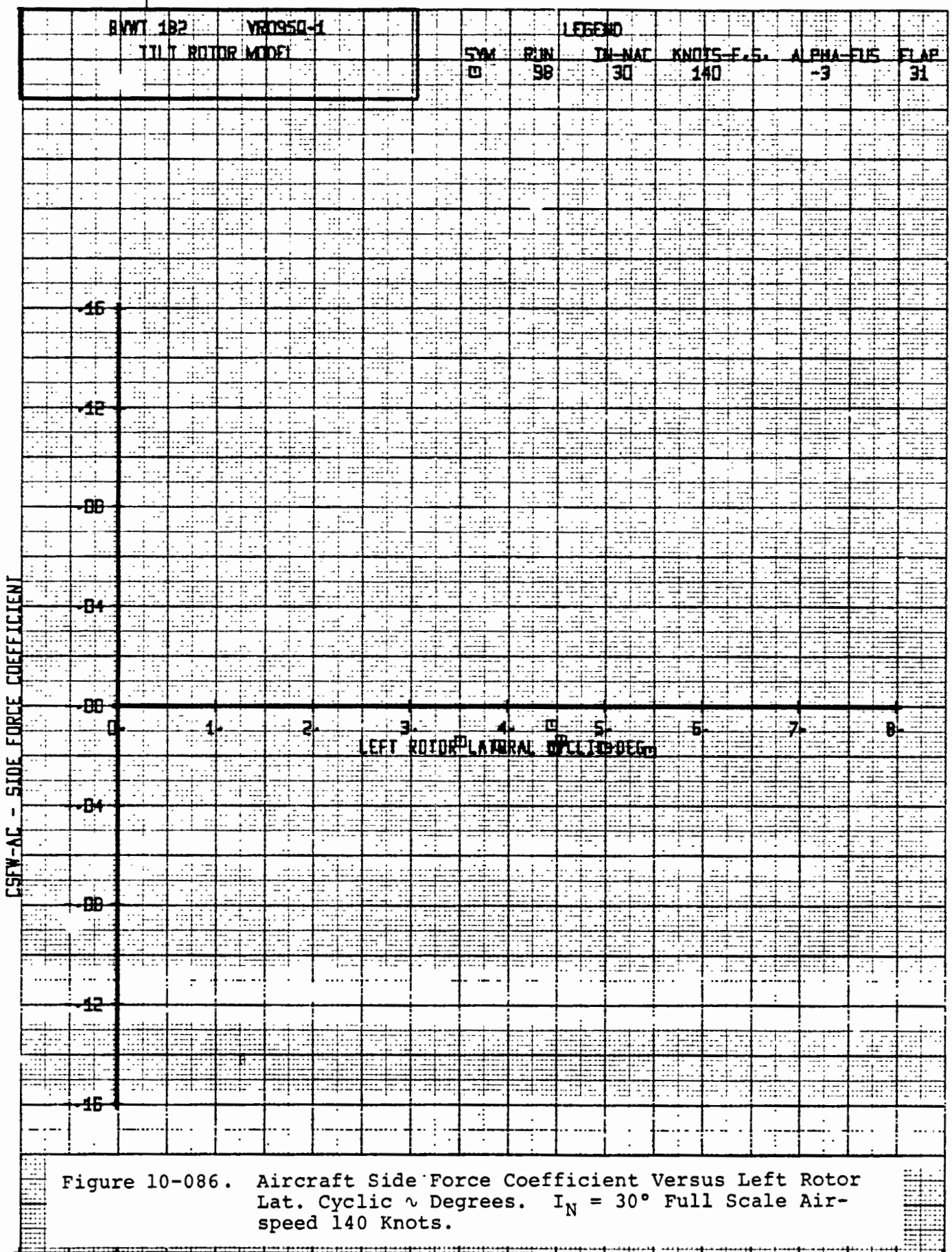


Figure 10-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

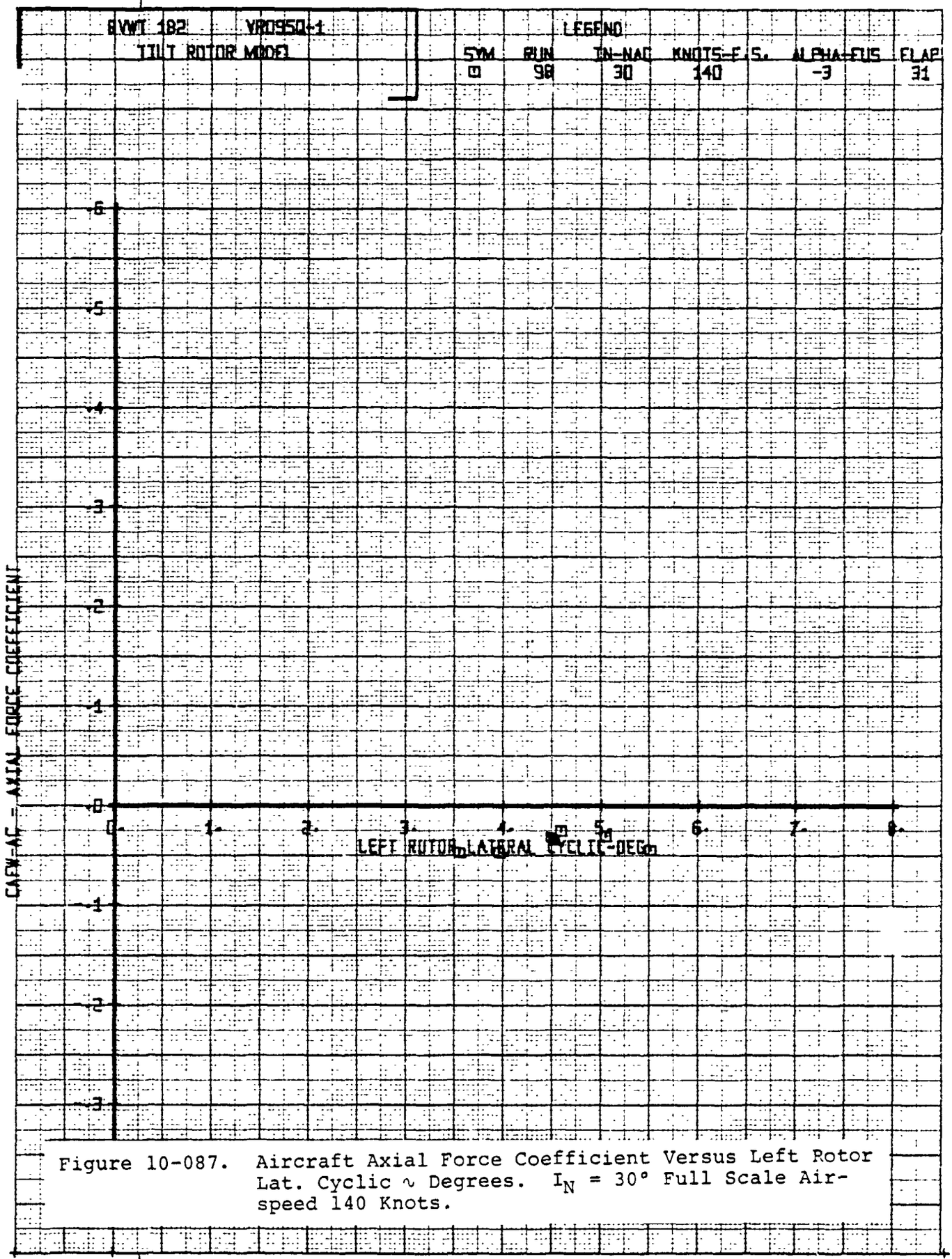


Figure 10-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

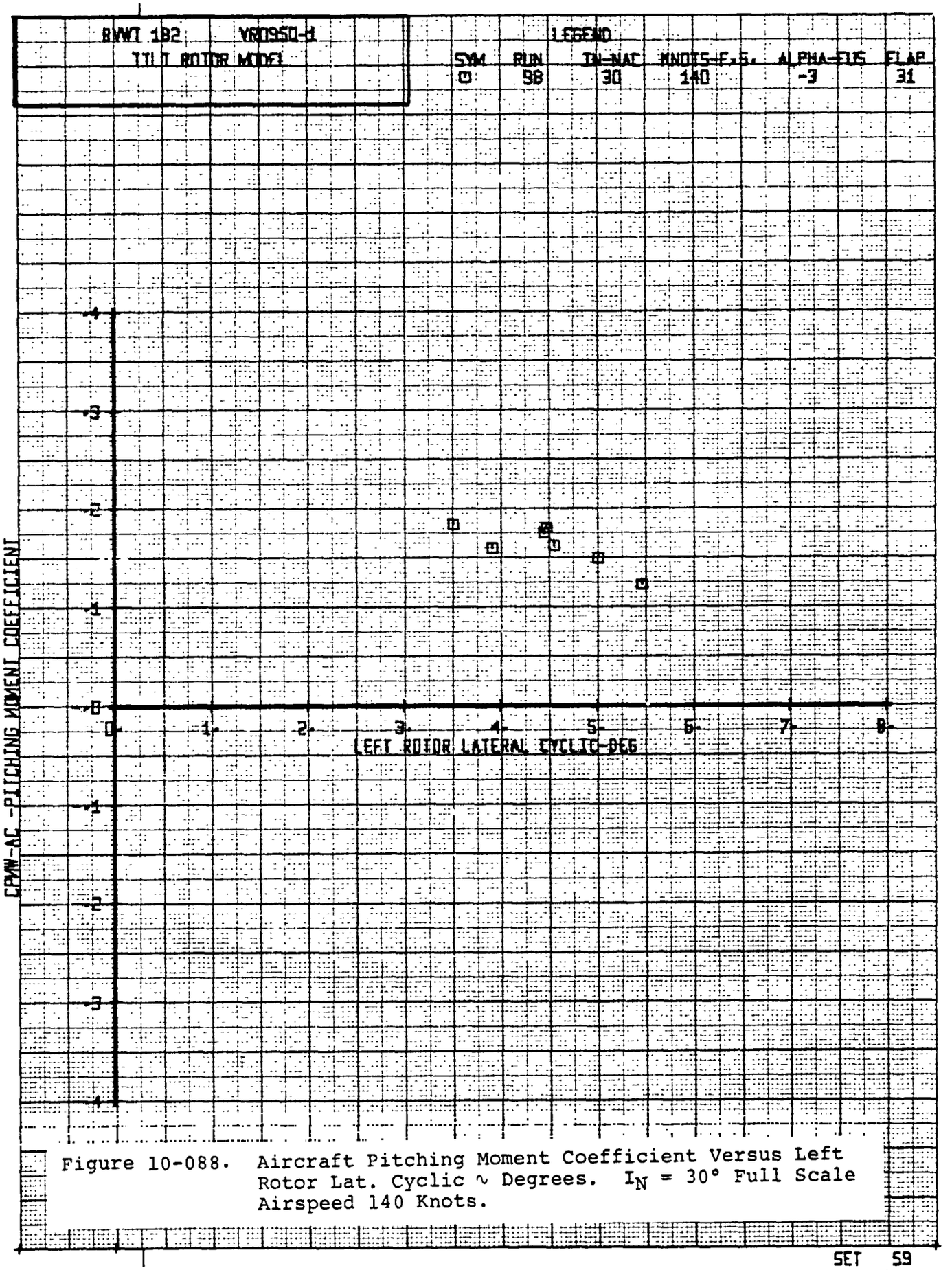


Figure 10-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

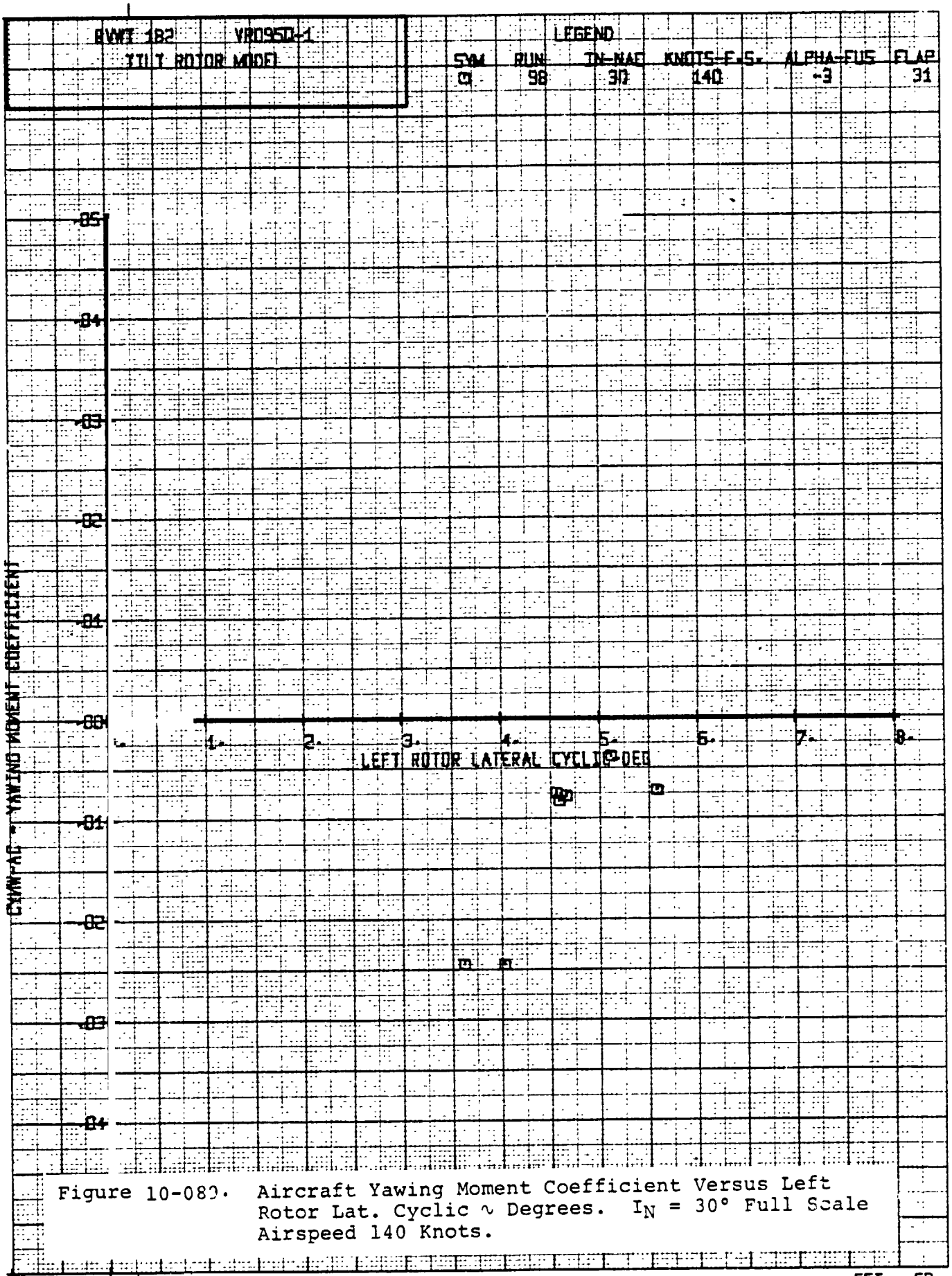


Figure 10-083. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

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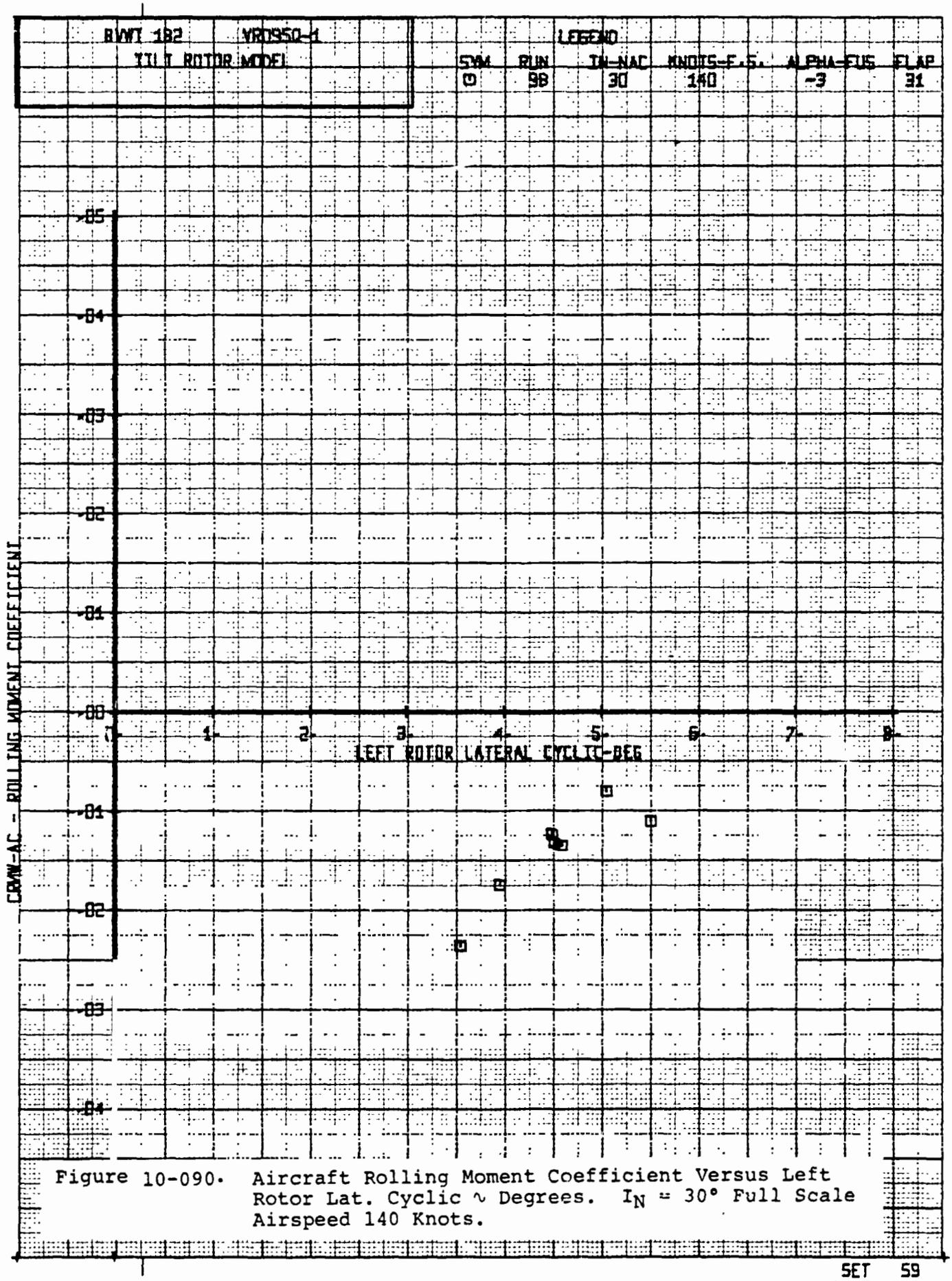


Figure 10-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

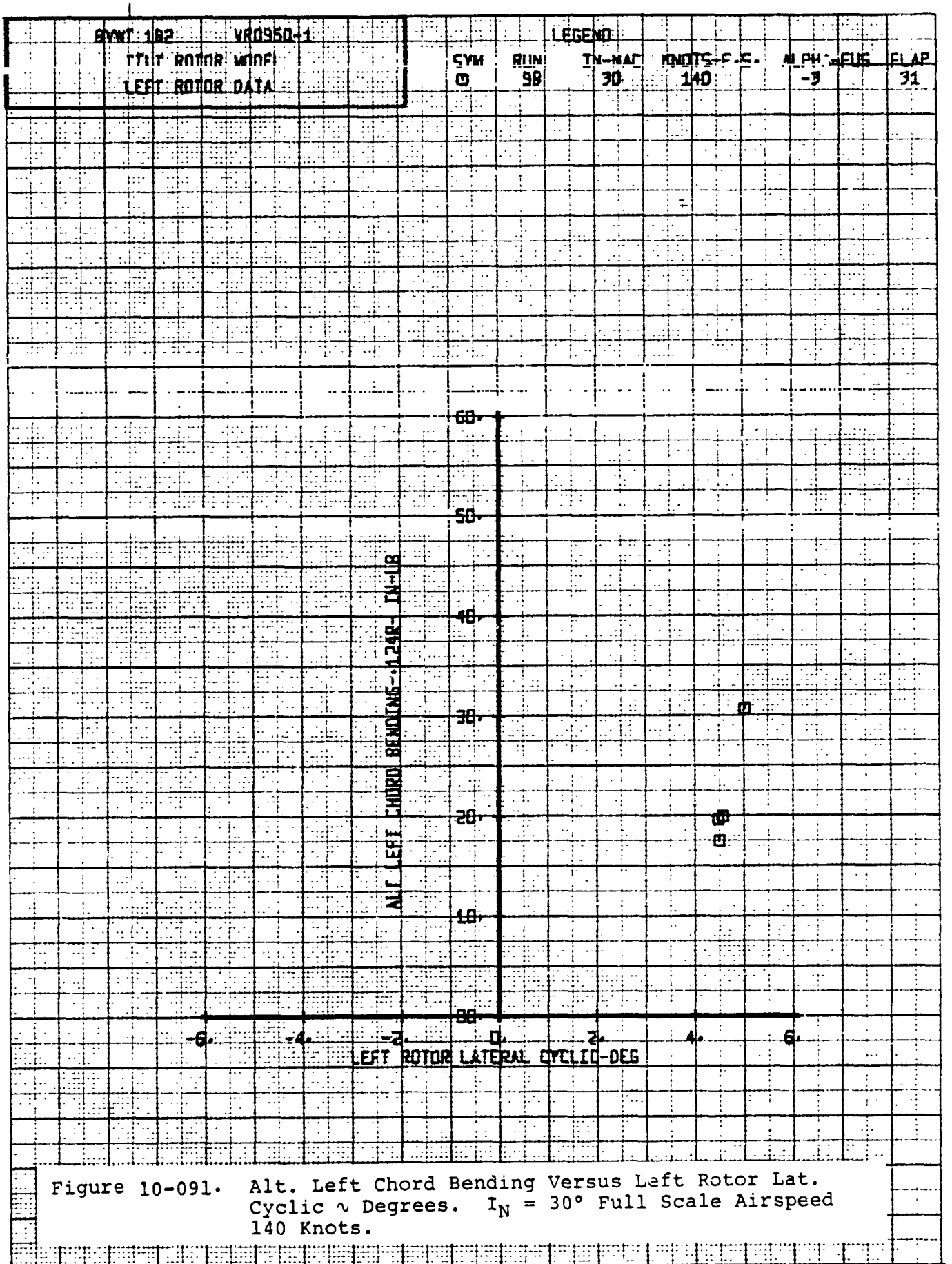


Figure 10-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

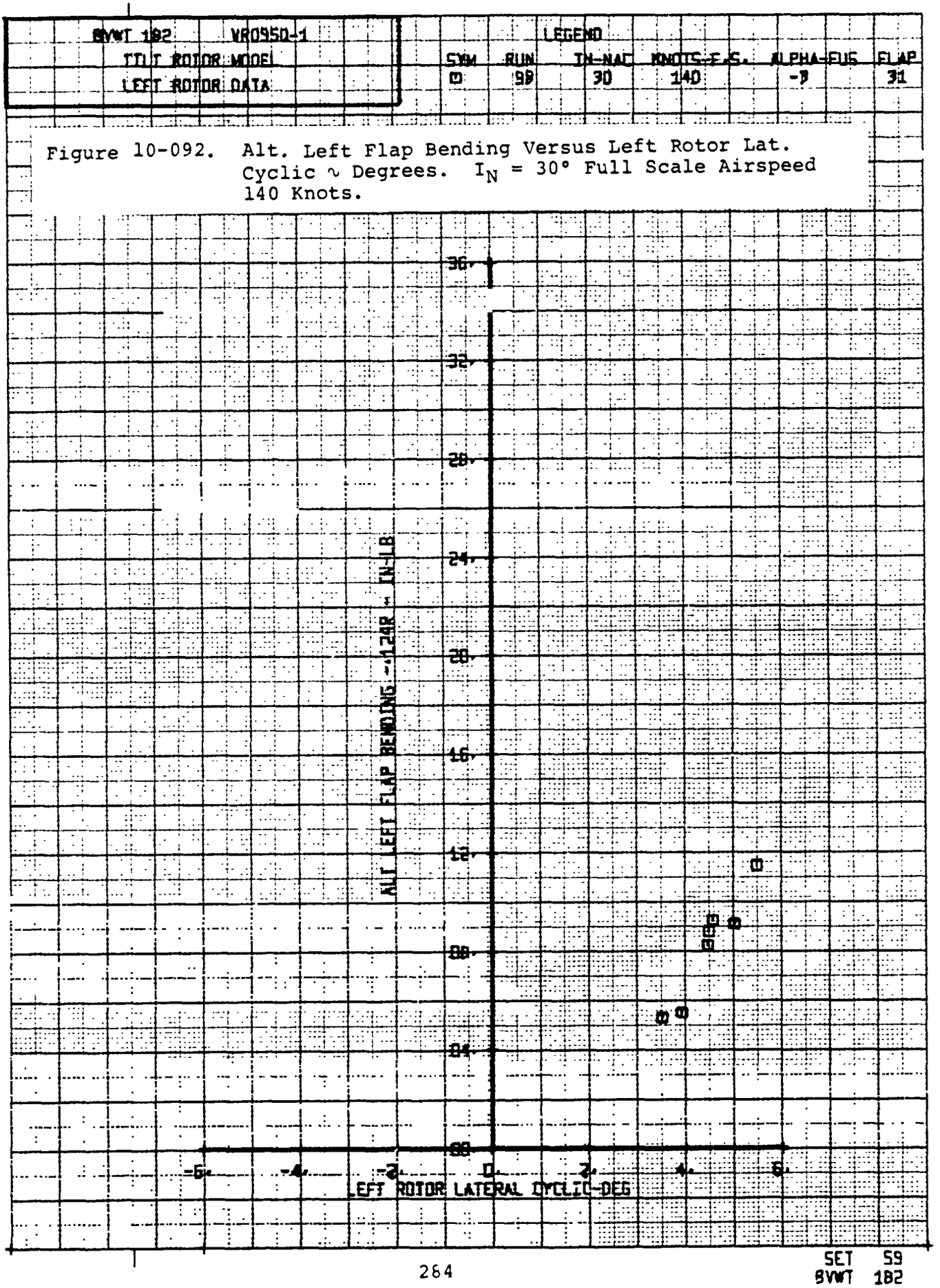
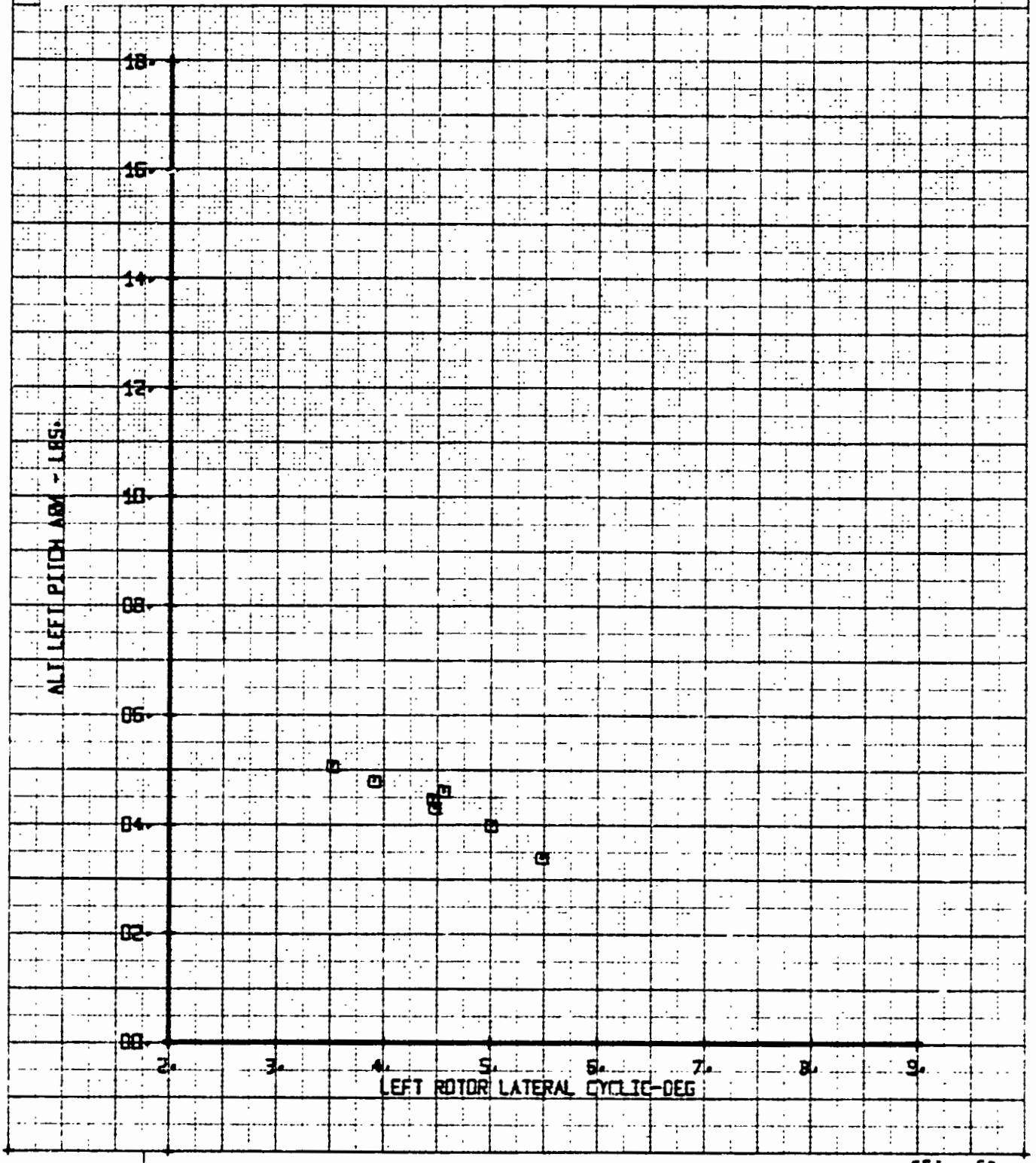


Figure 10-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BWWT 182 VRD950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	98	30	140	-3	31

Figure 10-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ egrees. I_N = 30° Full Scale Airspeed 140 Knots.



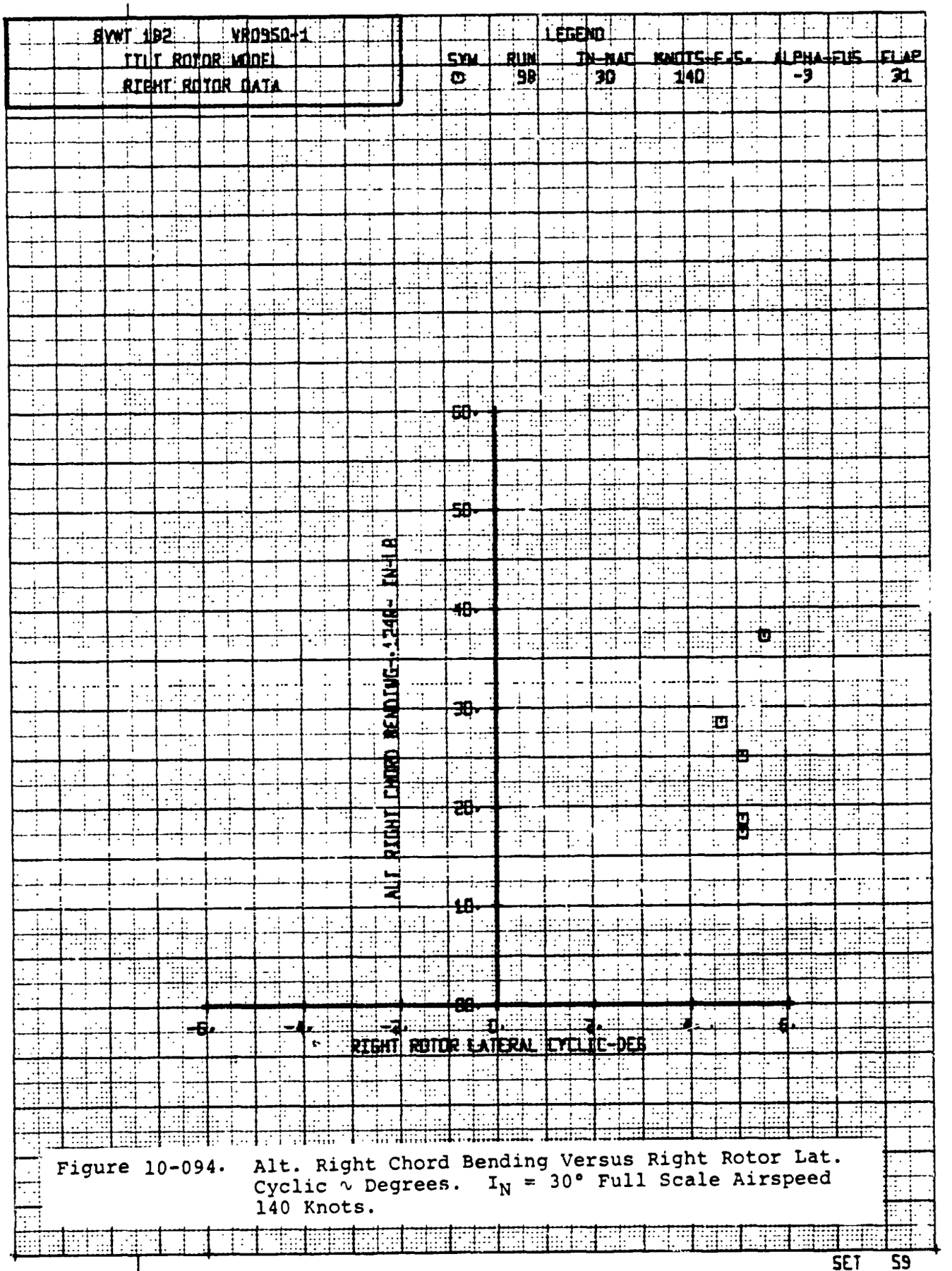
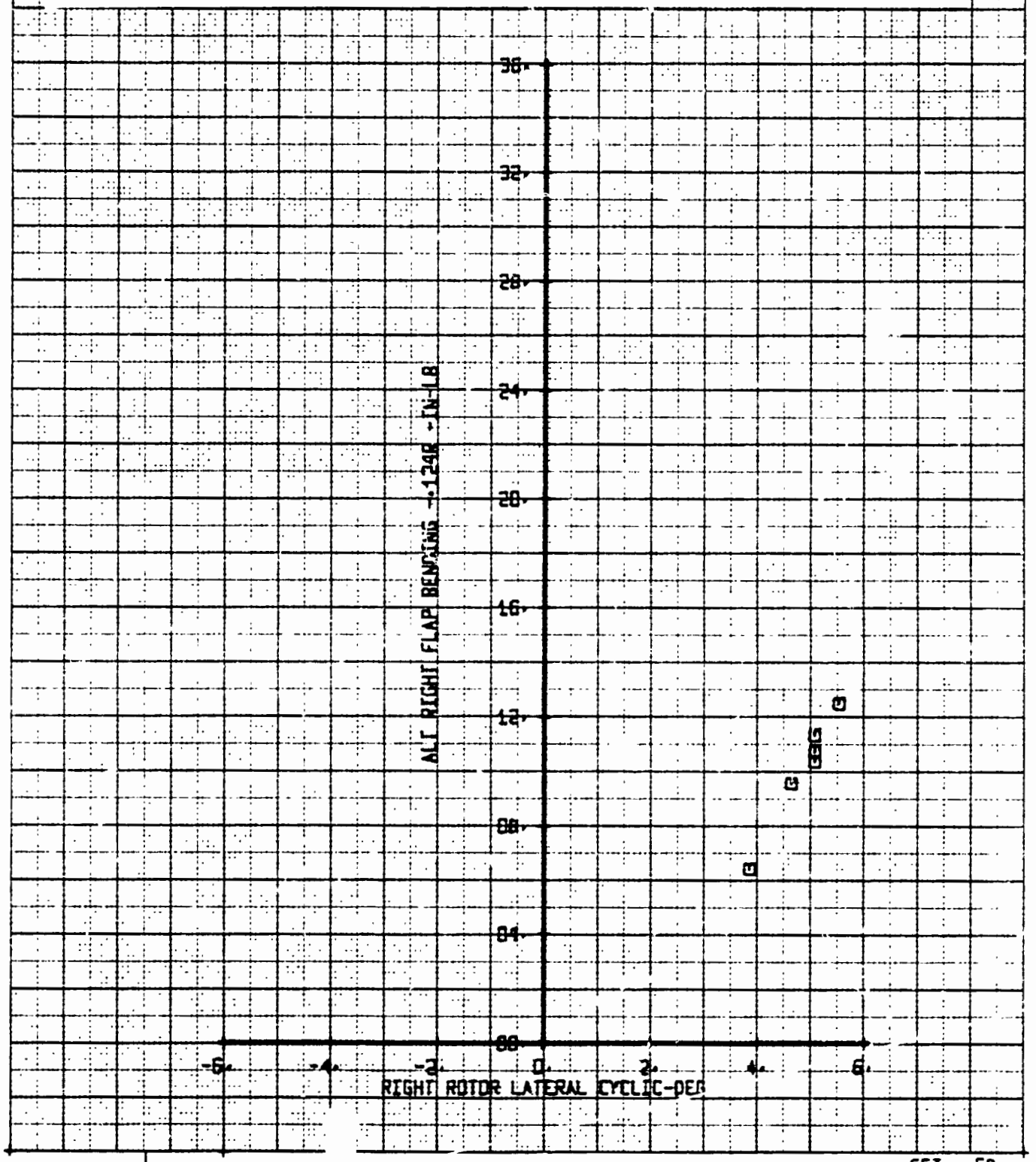


Figure 10-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
	⊡	98	30	140	-3	31

Figure 10-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

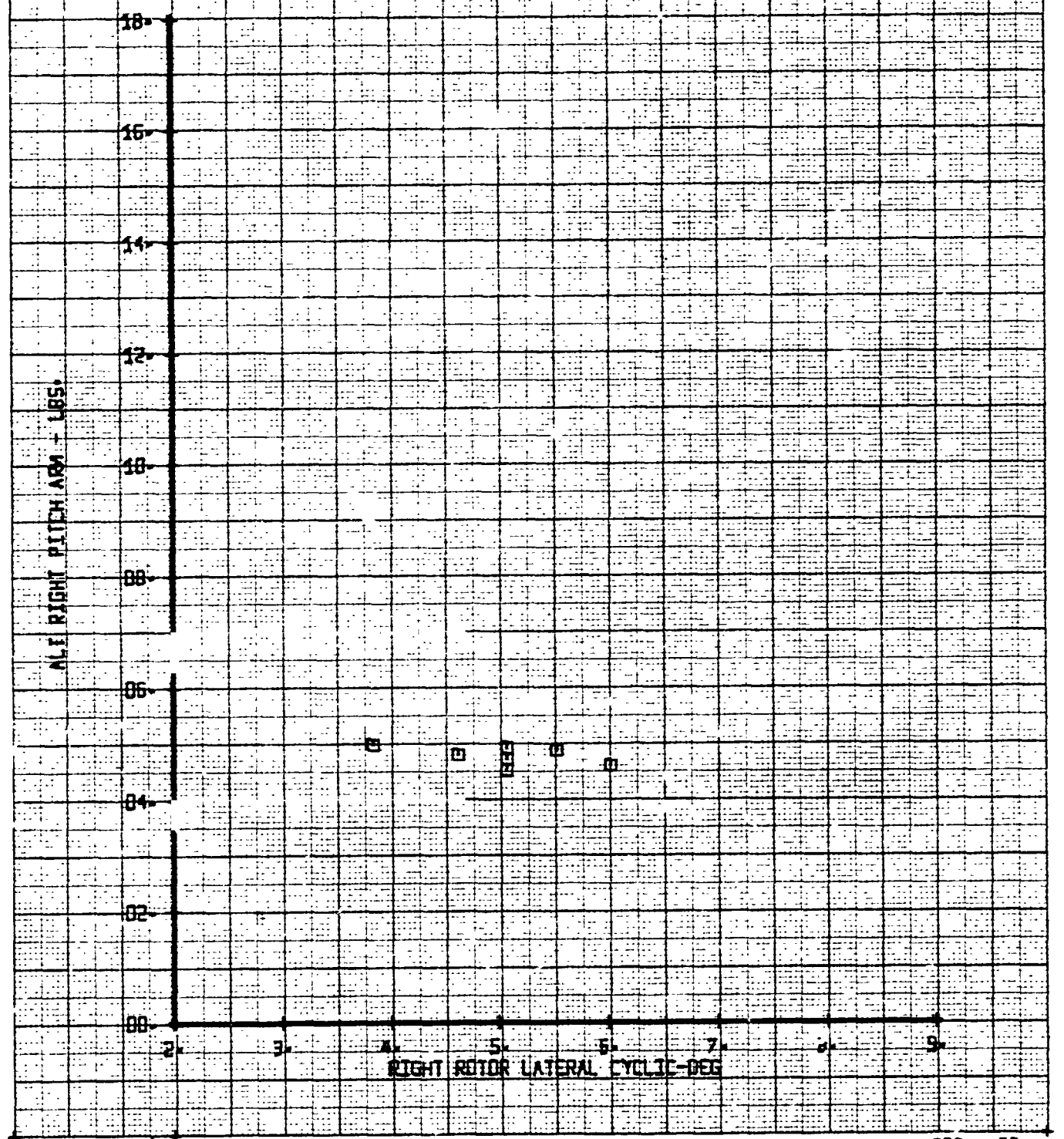


BVWT 182 YRDSSO-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	98	30	140	-3	31

Figure 10-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



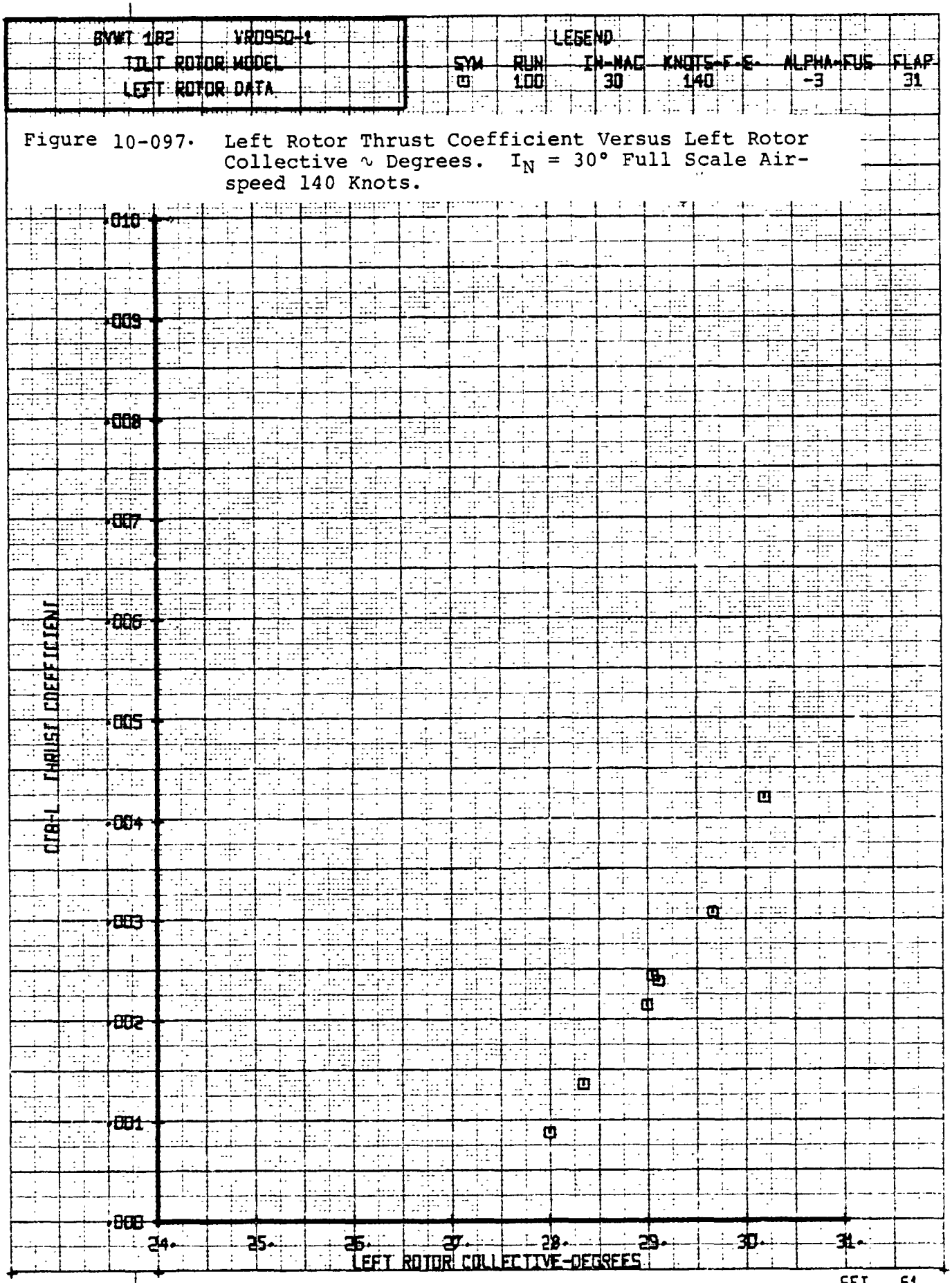
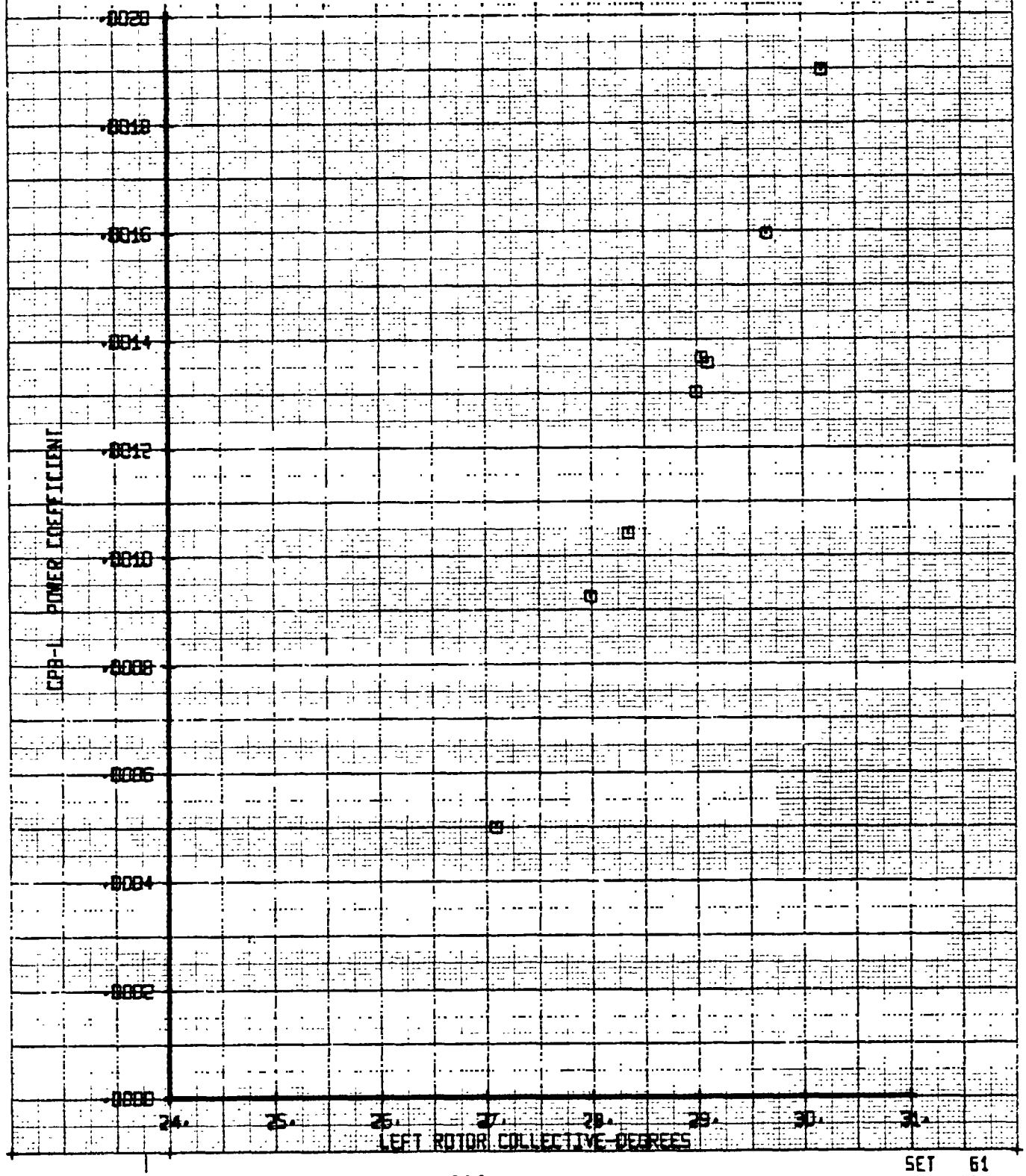


Figure 10-097. Left Rotor Thrust Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BWT 1:82 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	100	30	140	-3	31

Figure 10-098. Left Rotor Power Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



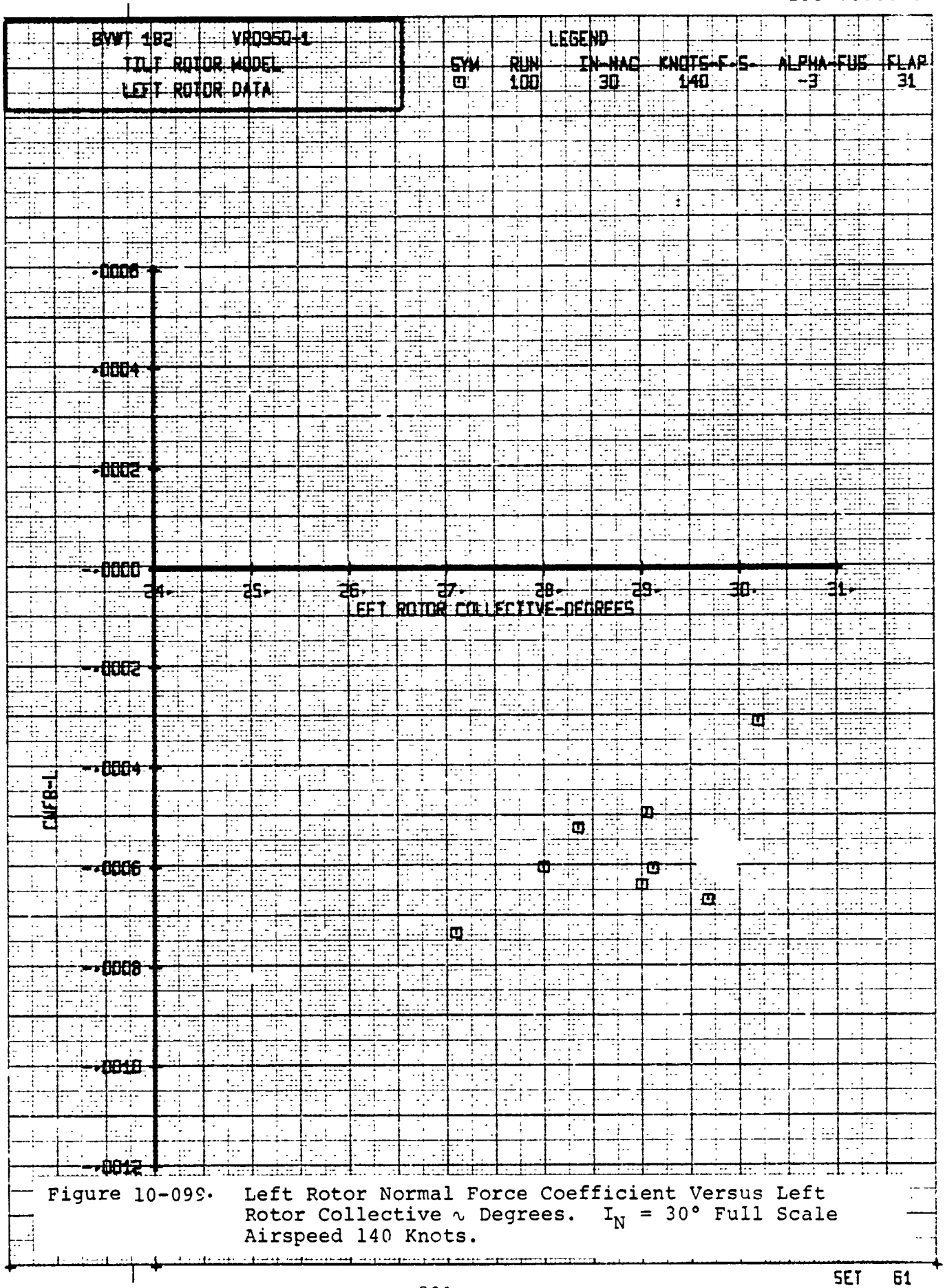


Figure 10-099. Left Rotor Normal Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

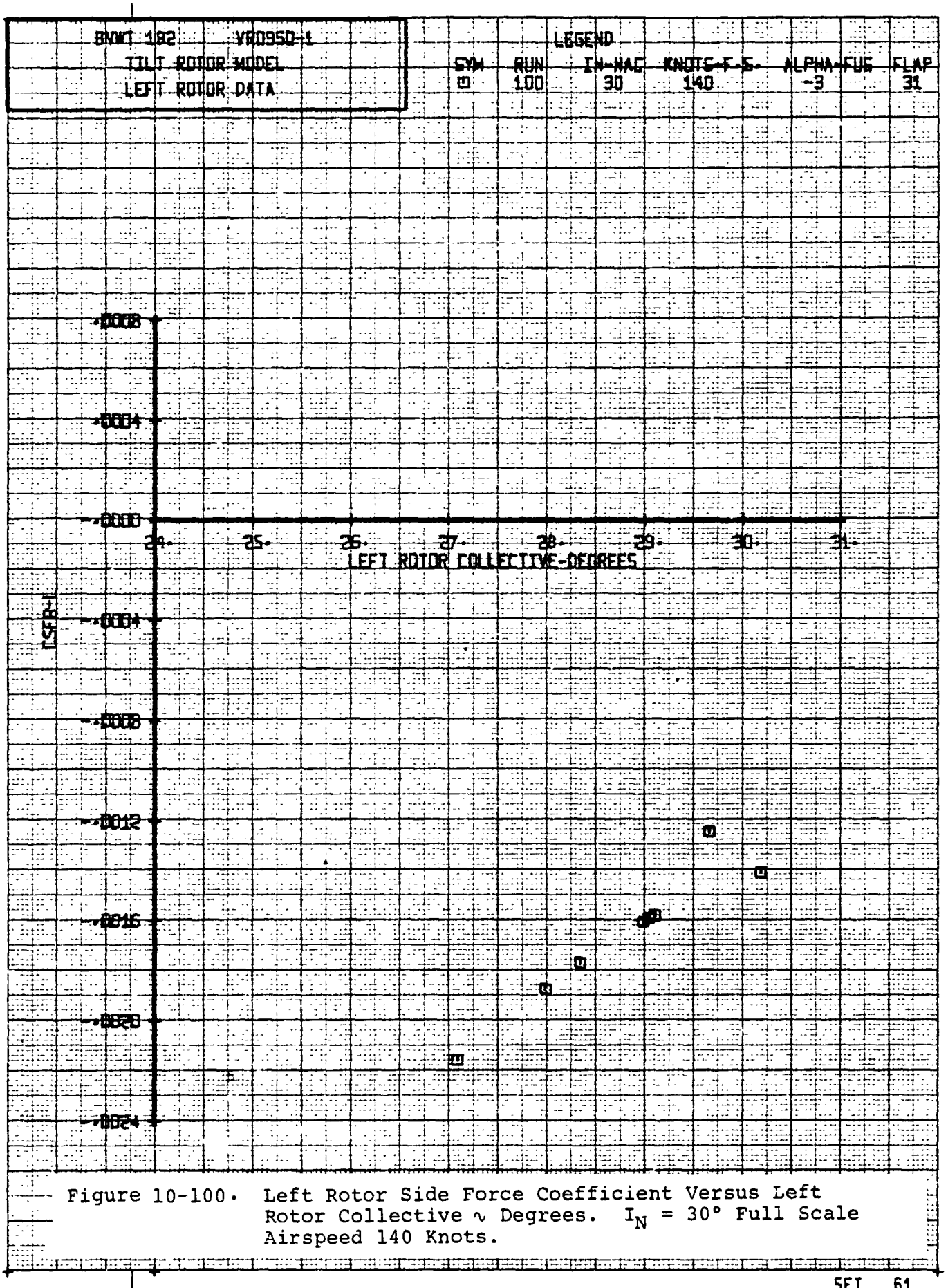


Figure 10-100. Left Rotor Side Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

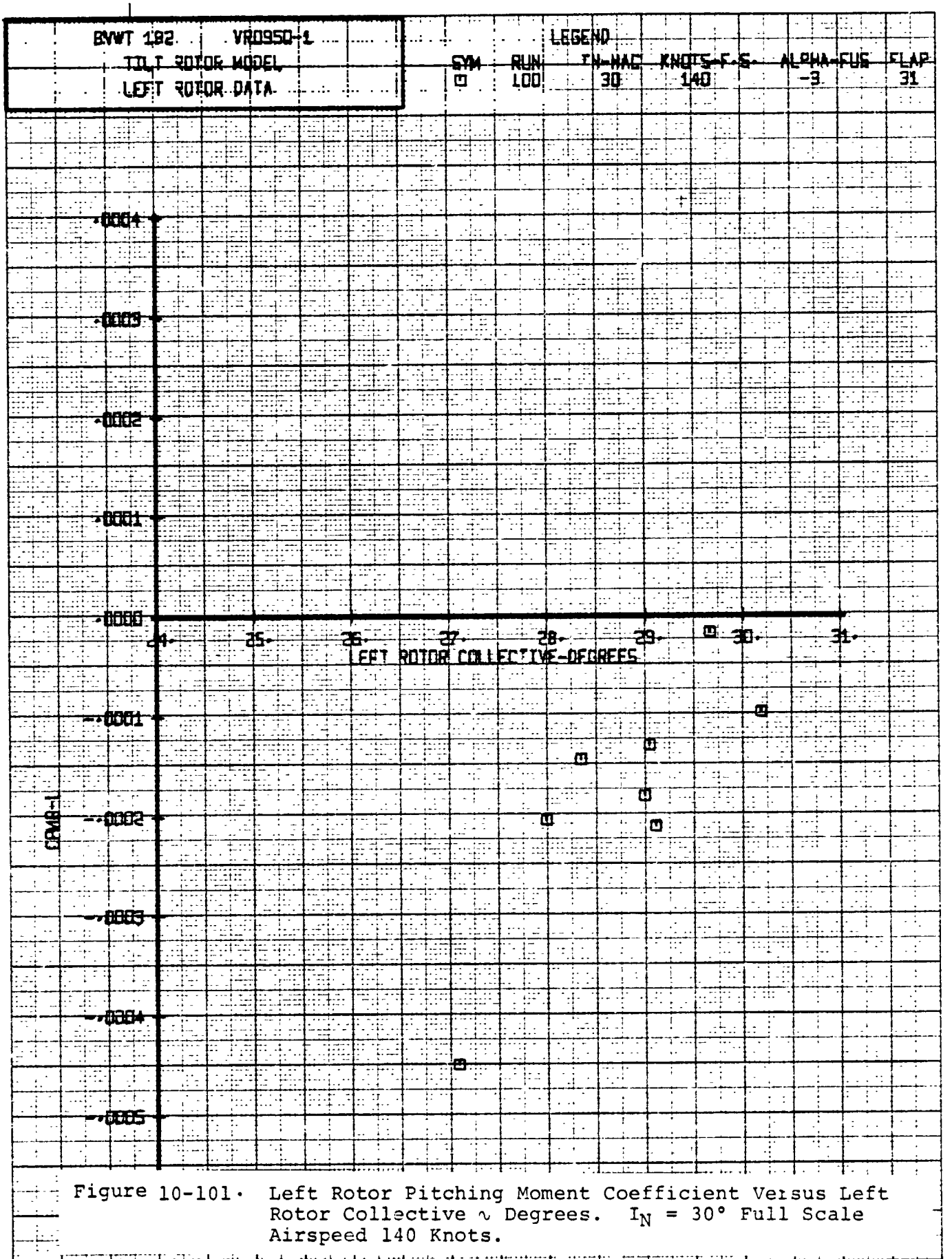


Figure 10-101. Left Rotor Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

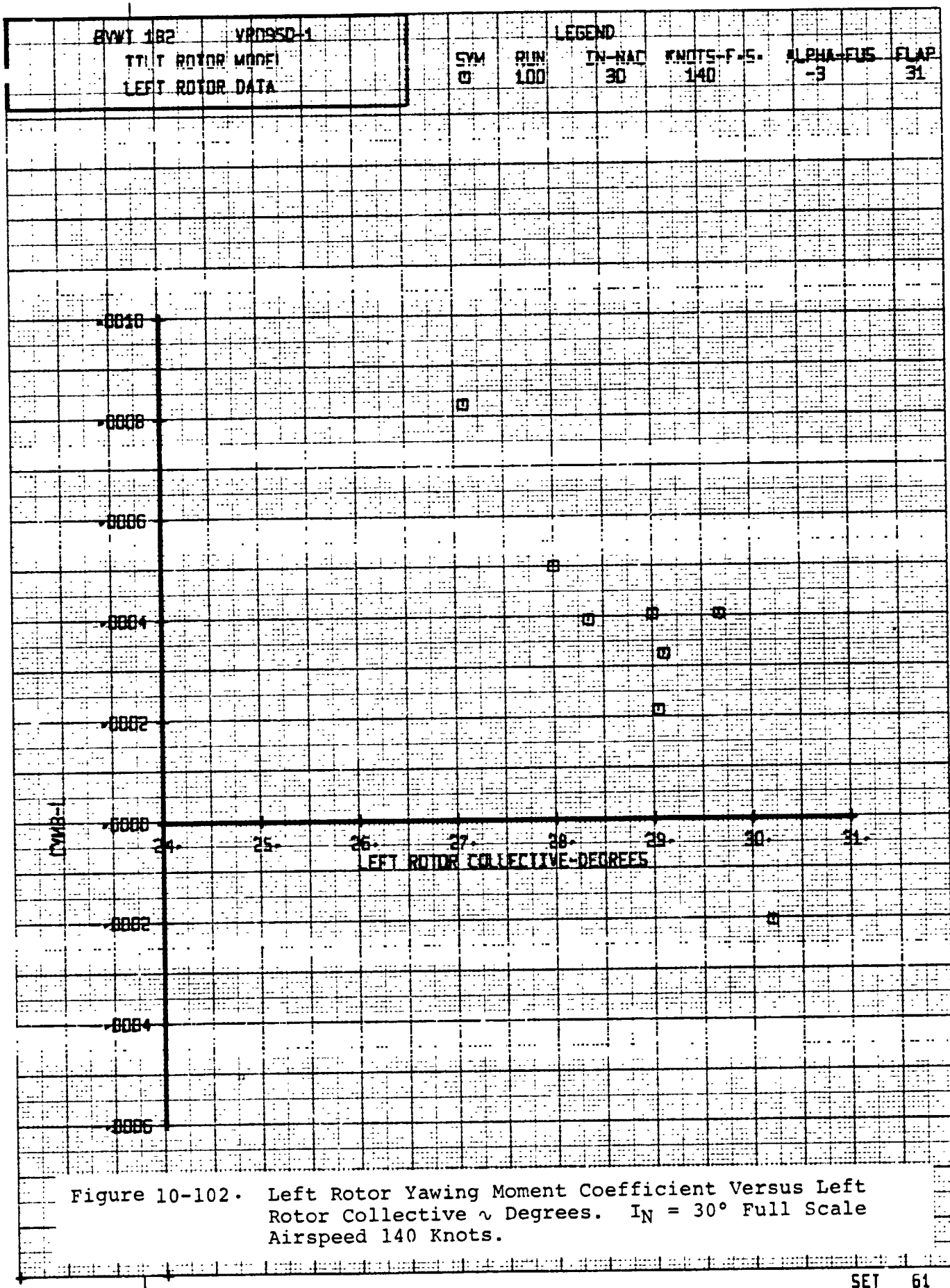
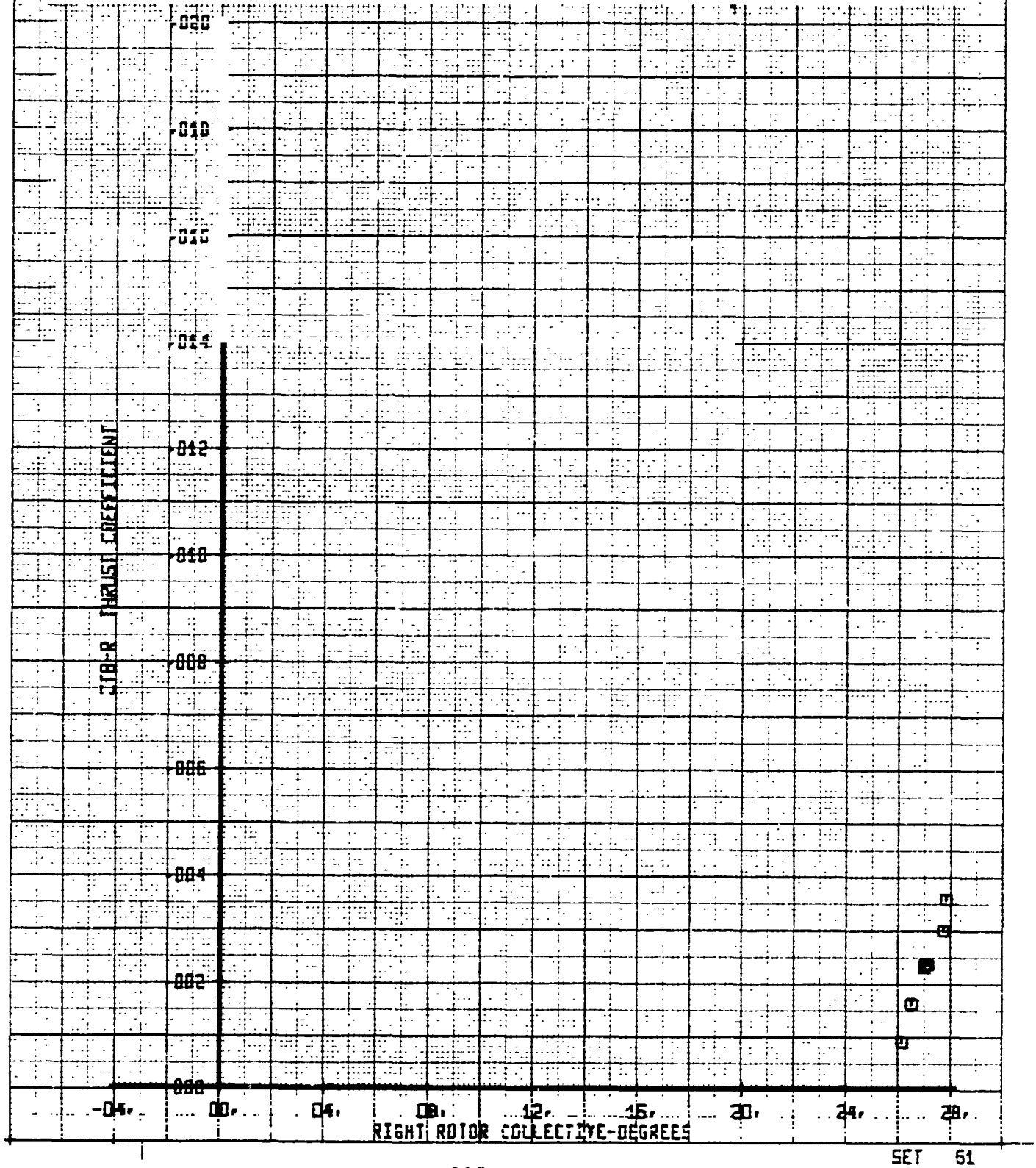


Figure 10-102. Left Rotor Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
○	100	30	140	-3	31

Figure 10-103 - Right Rotor Thrust Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



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BVWT 182

SET 61
BVWT 182

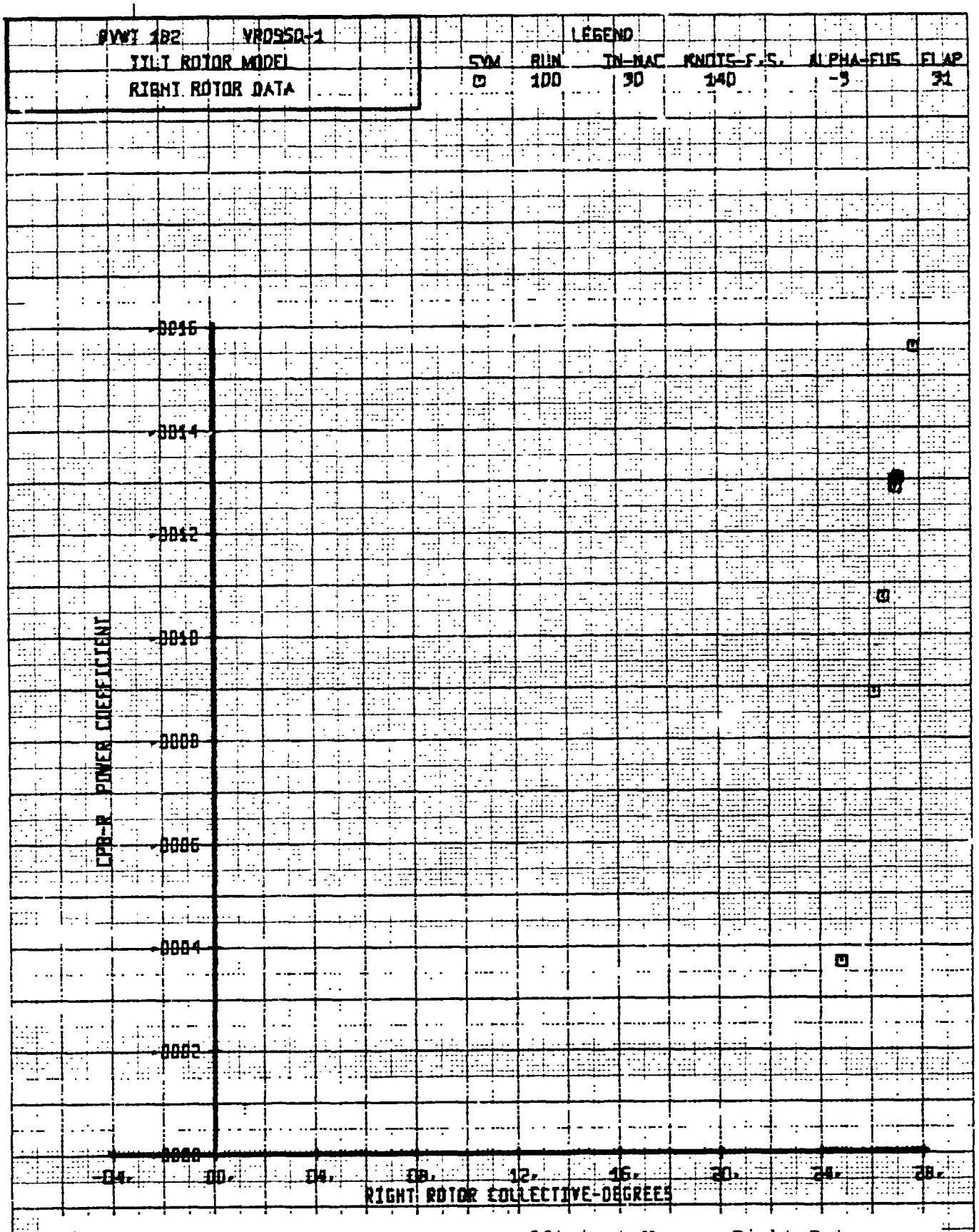
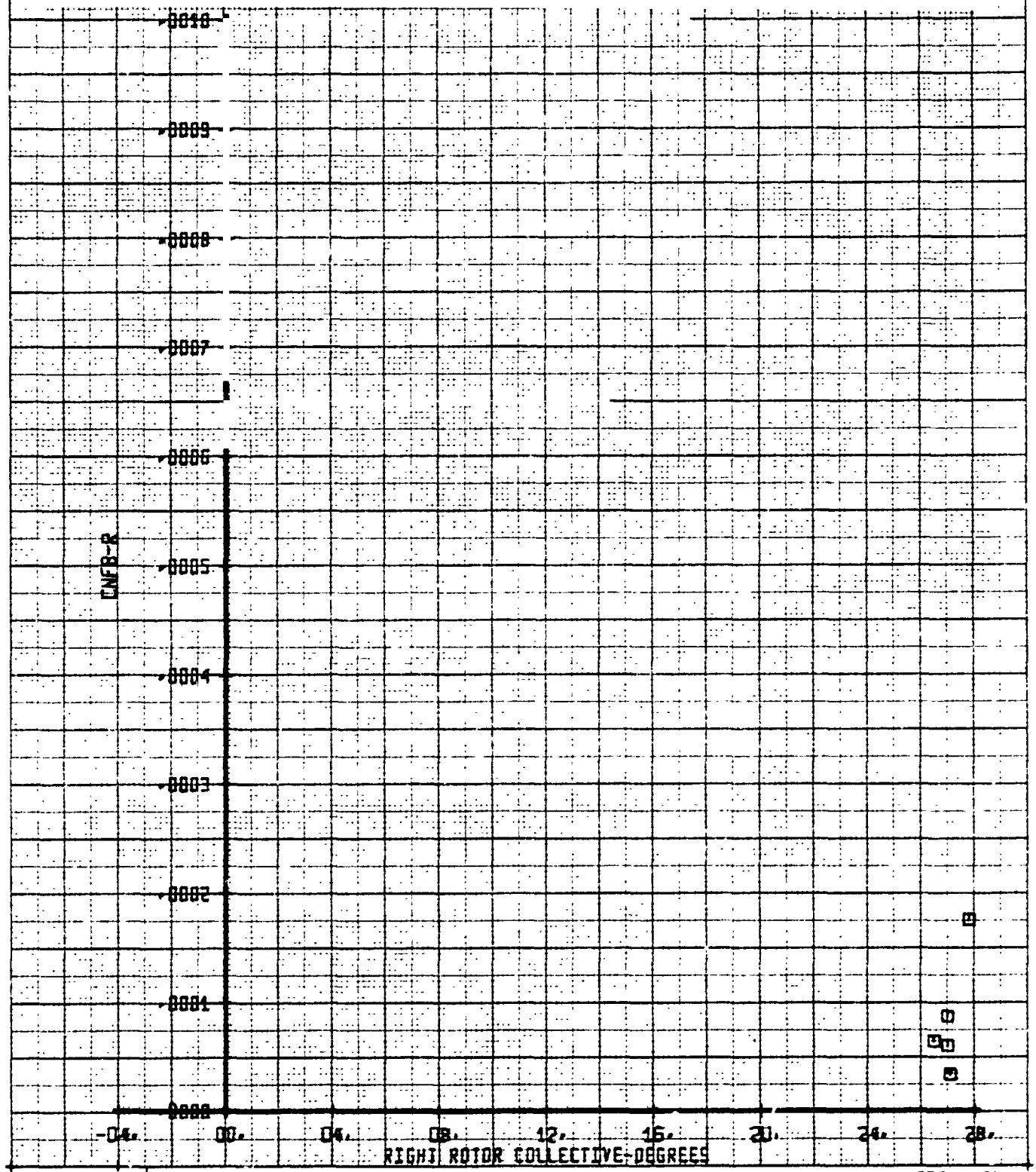


Figure 10-104. Right Rotor Power Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
	⊡	100	30	140	-3	31

Figure 10-105. Right Rotor Normal Force Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



FT 61
182

SET 61
BVWT 182

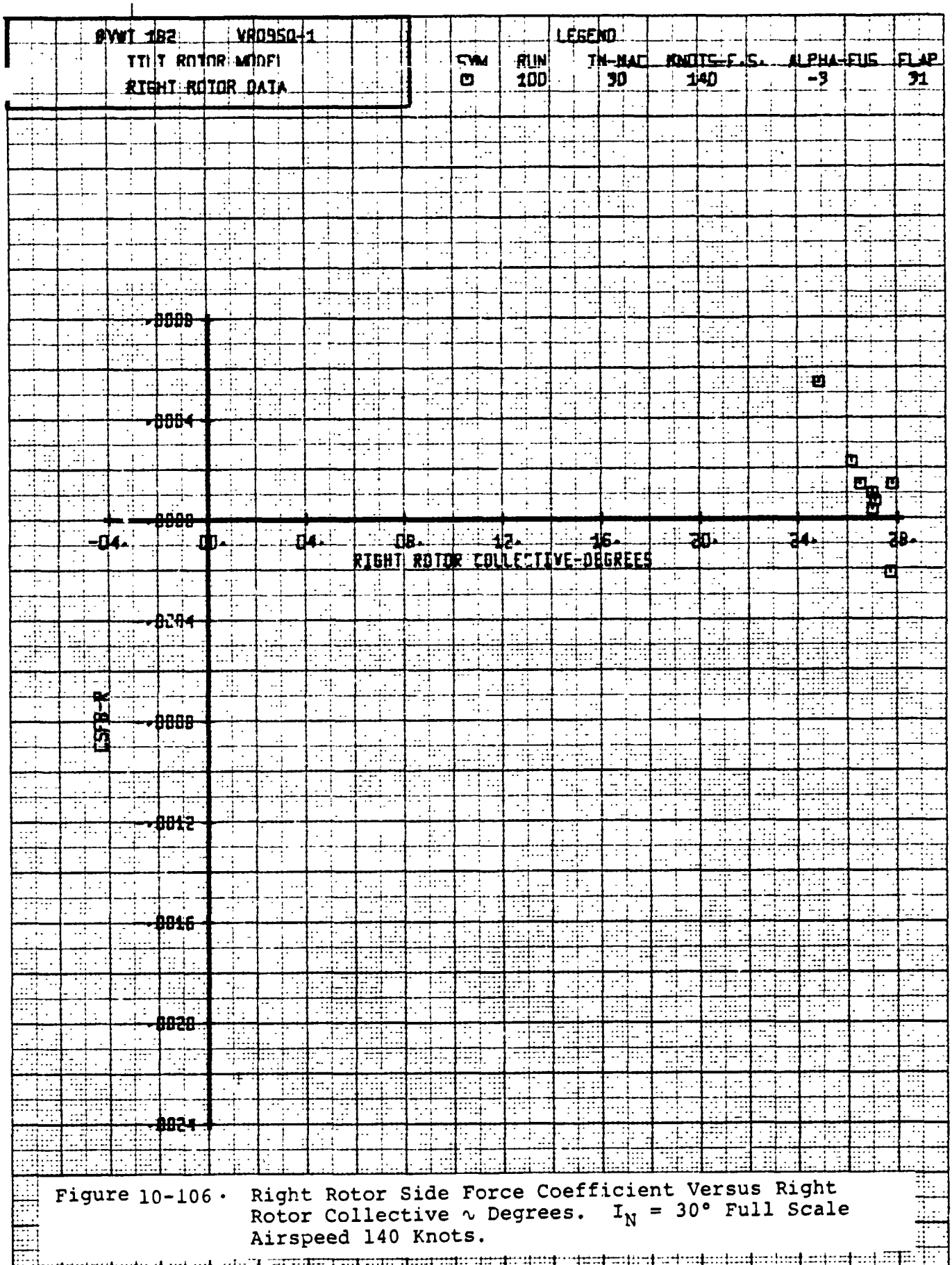


Figure 10-106. Right Rotor Side Force Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

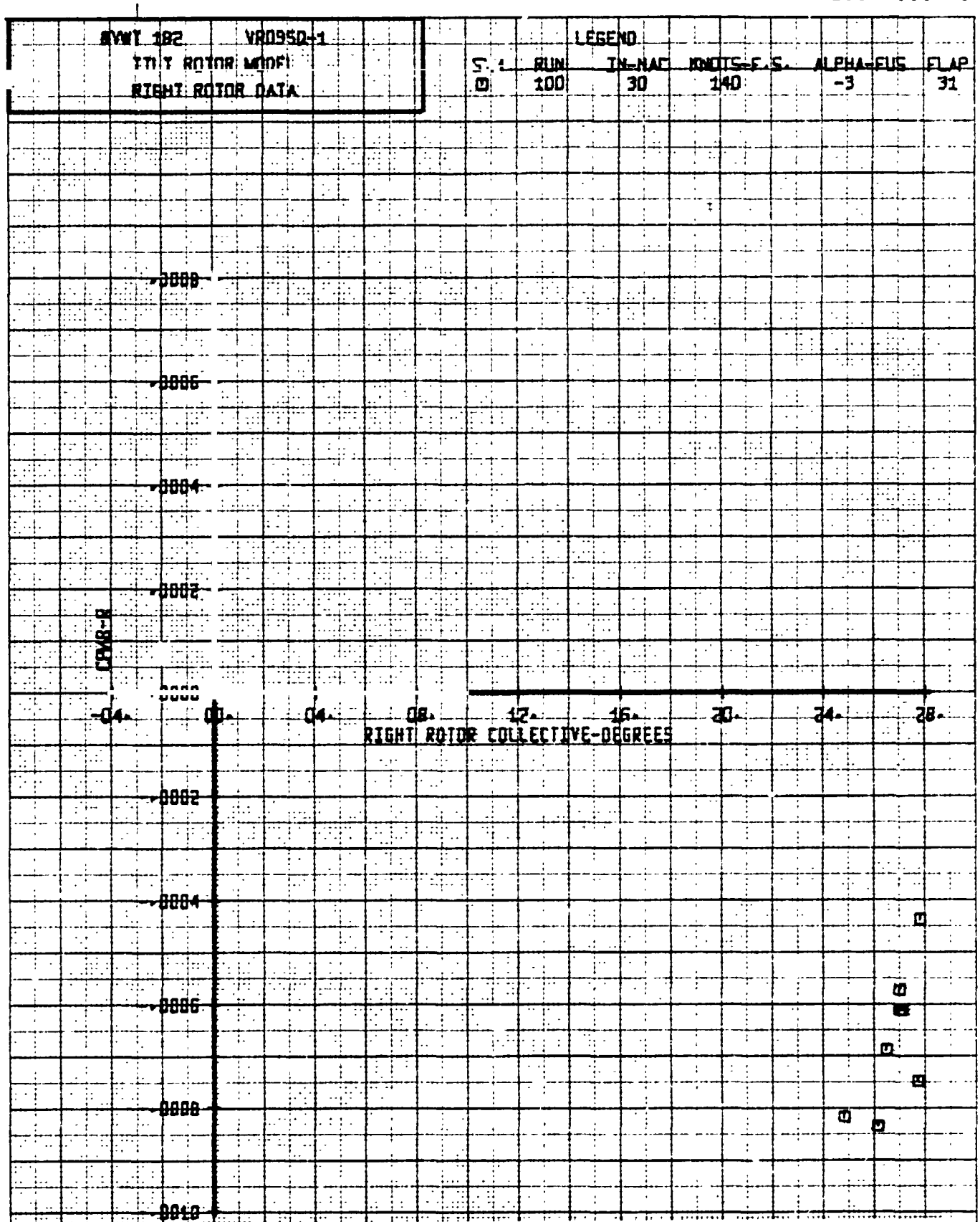


Figure 10-107. Right Rotor Pitching Moment Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

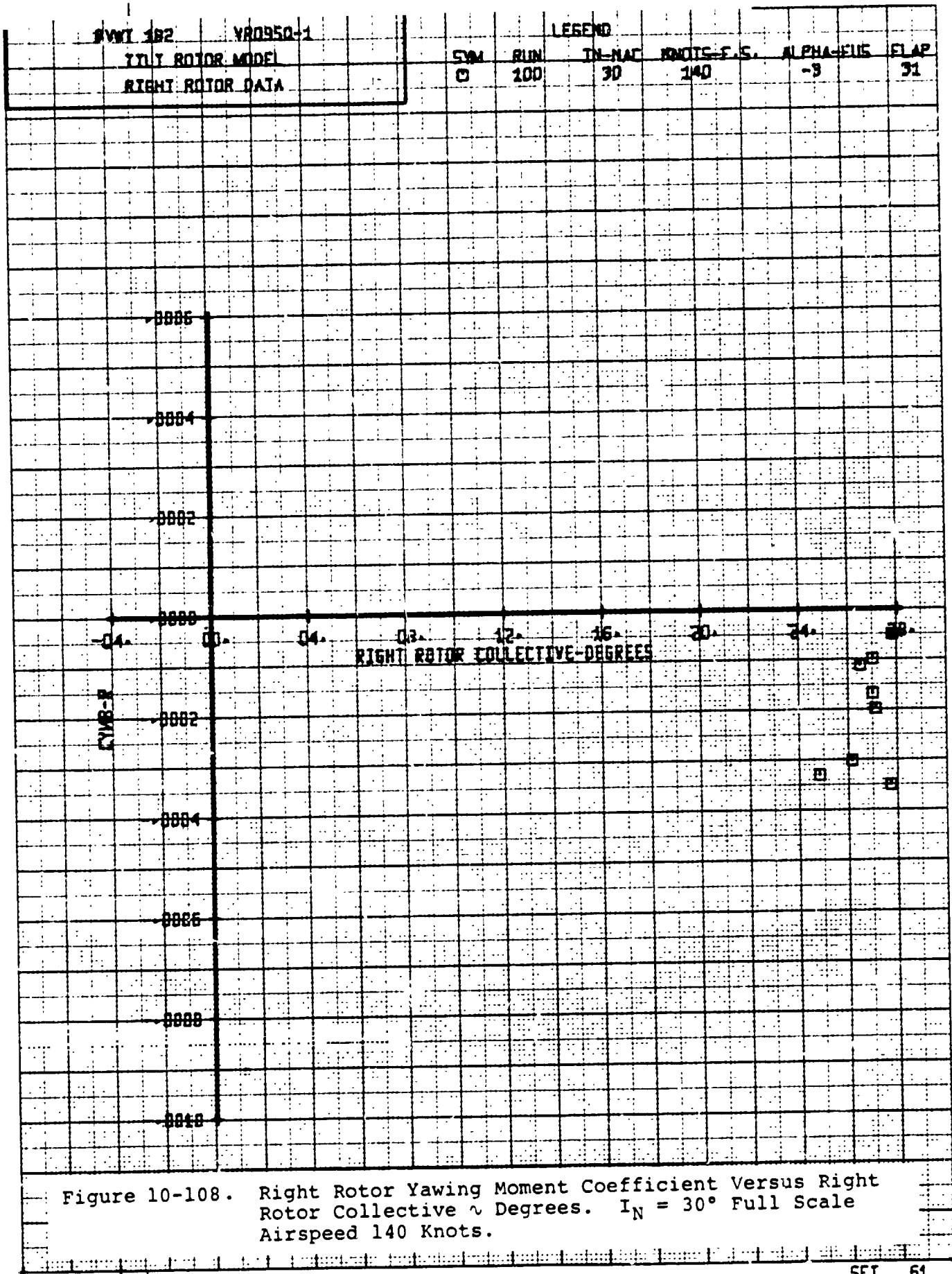


Figure 10-108. Right Rotor Yawing Moment Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

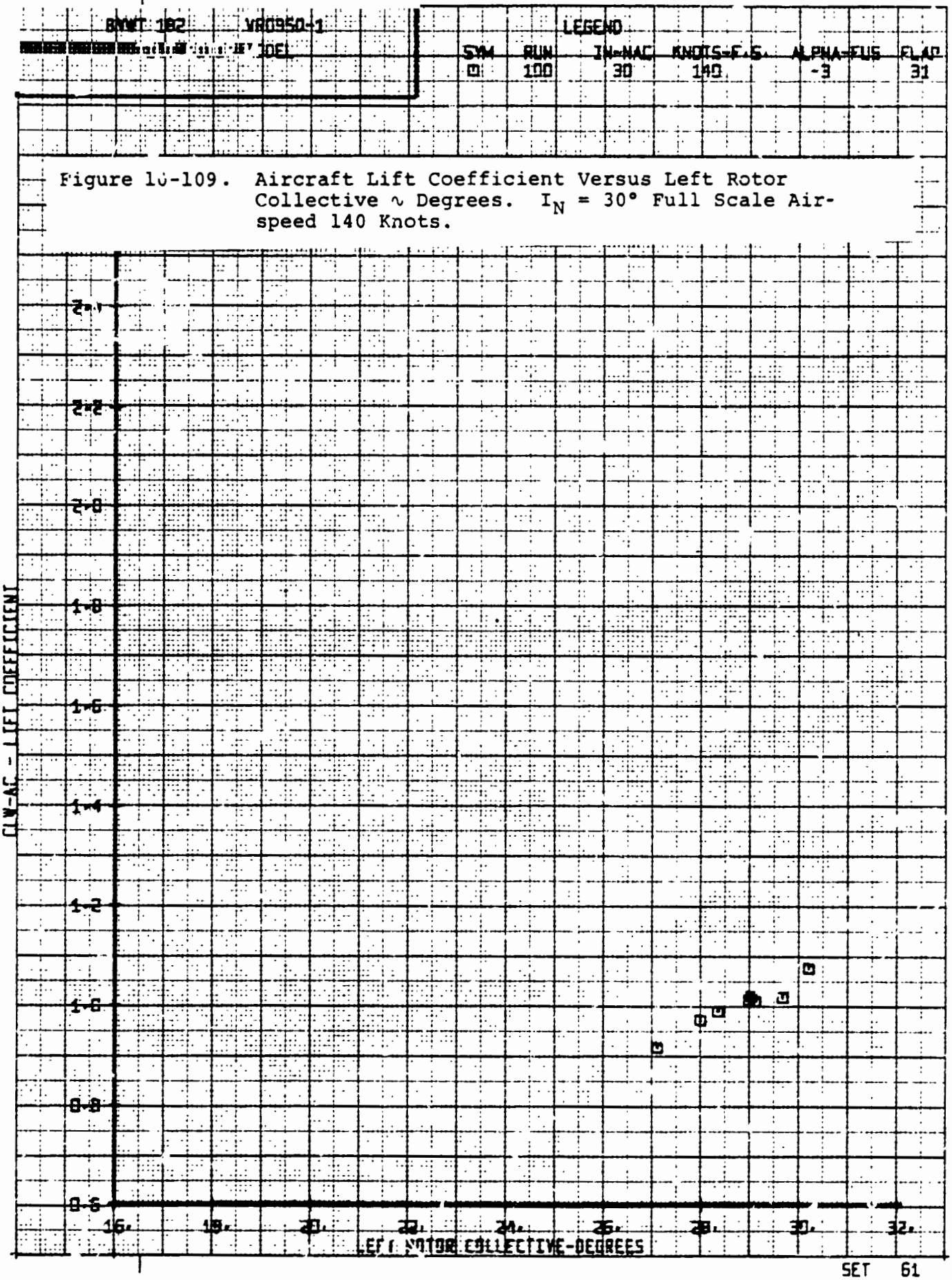


Figure 10-109. Aircraft Lift Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

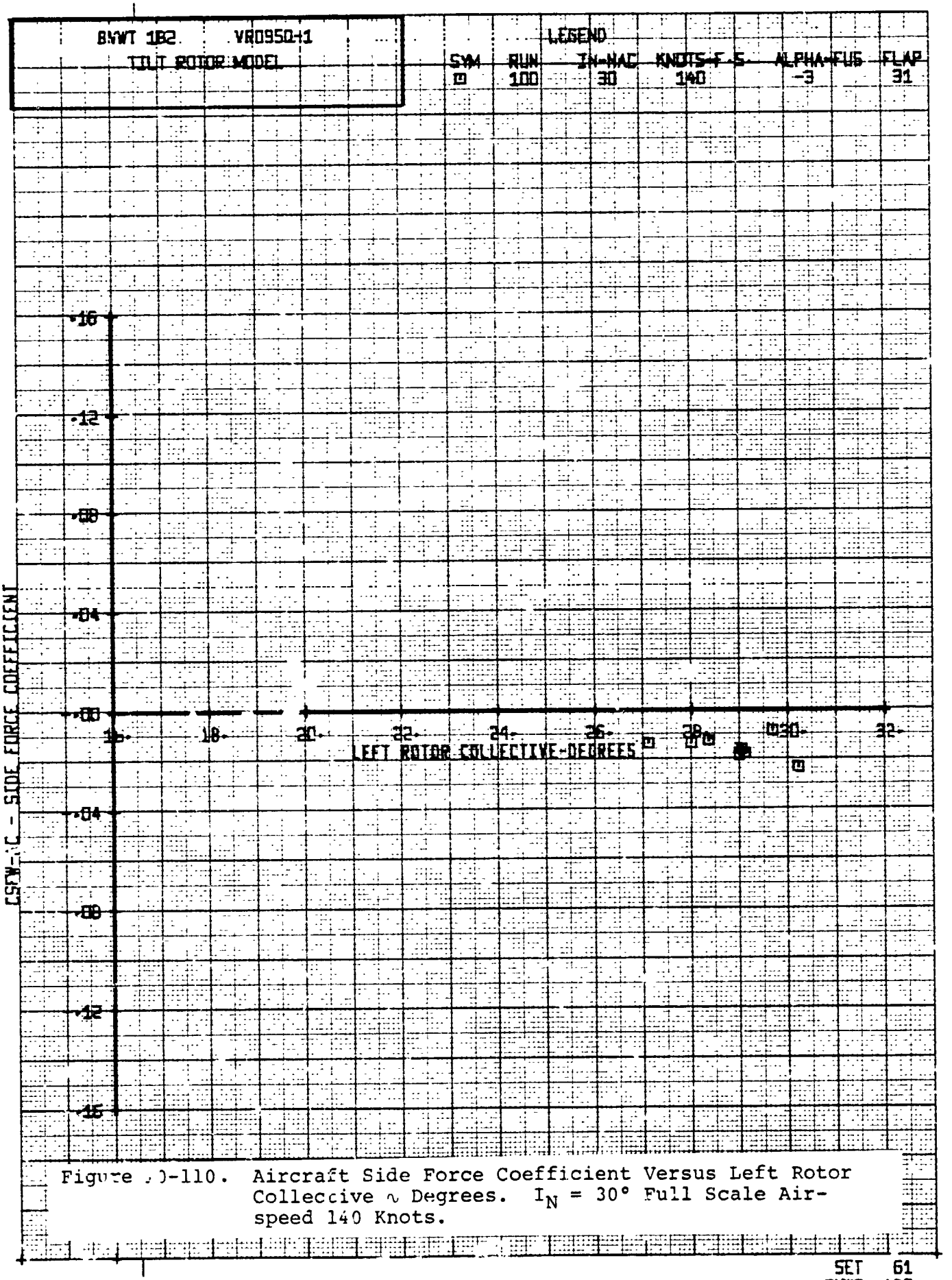


Figure 10-110. Aircraft Side Force Coefficient Versus Left Rotor Collecctive ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

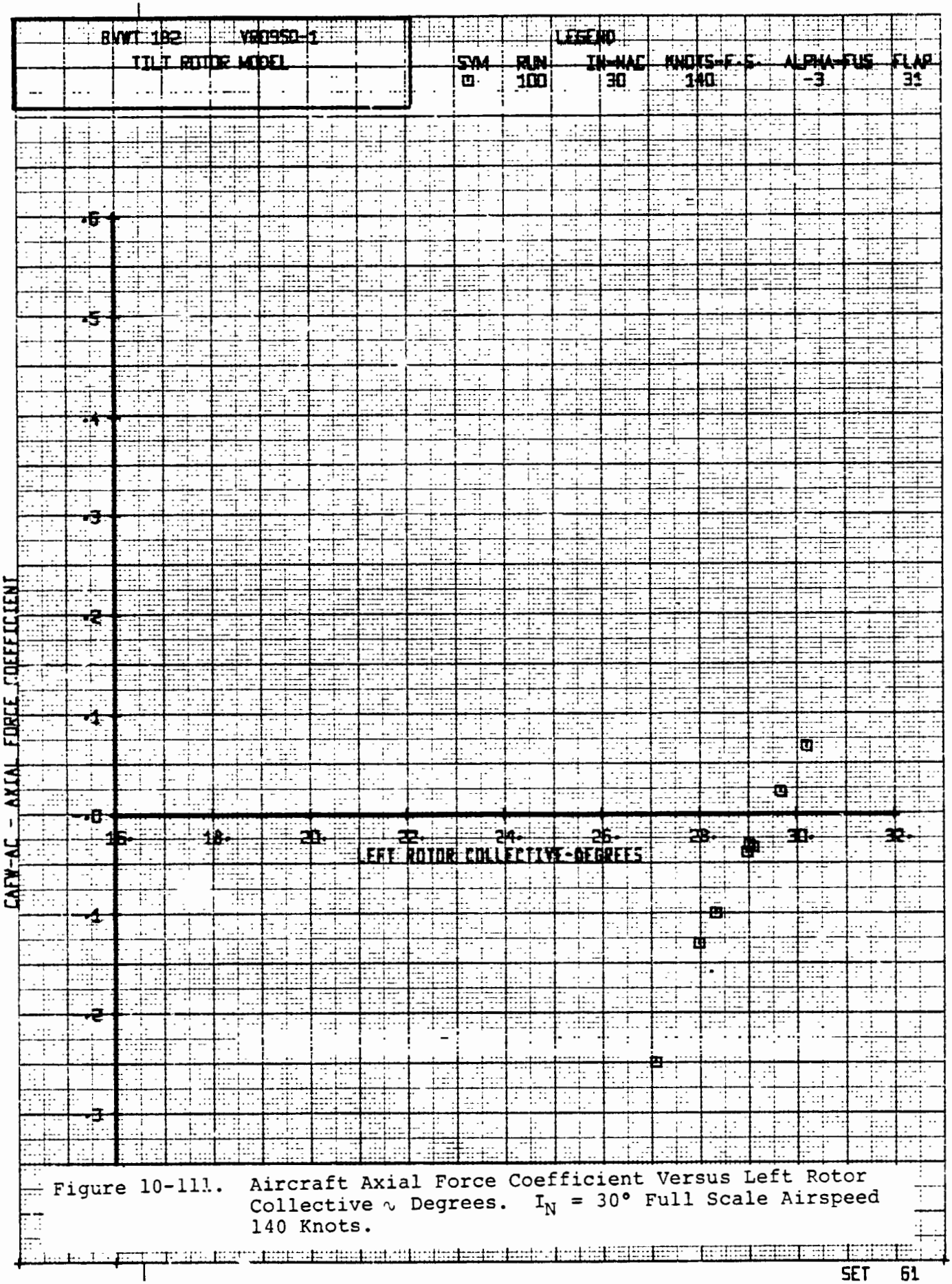


Figure 10-111. Aircraft Axial Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

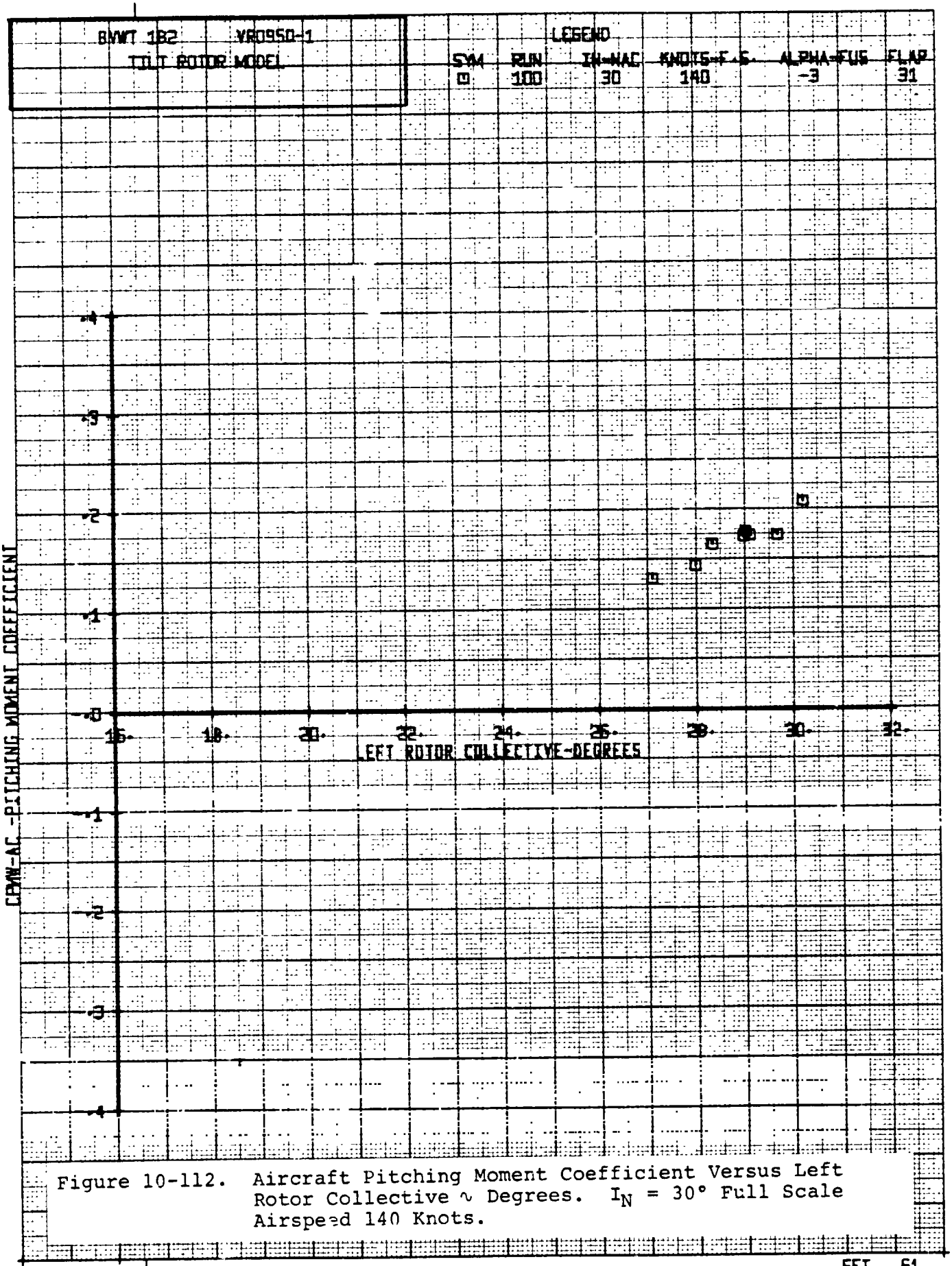


Figure 10-112. Aircraft Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

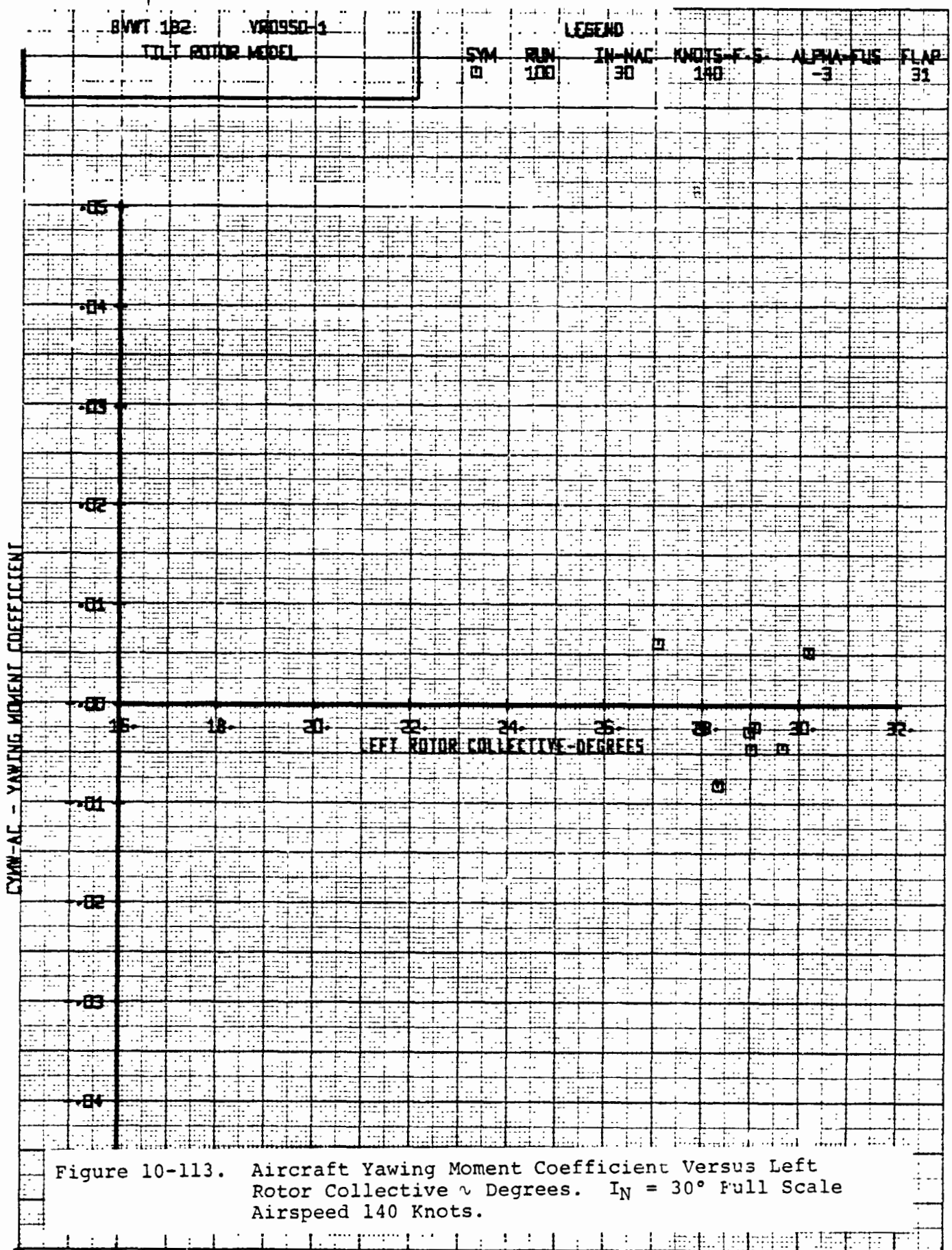


Figure 10-113. Aircraft Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

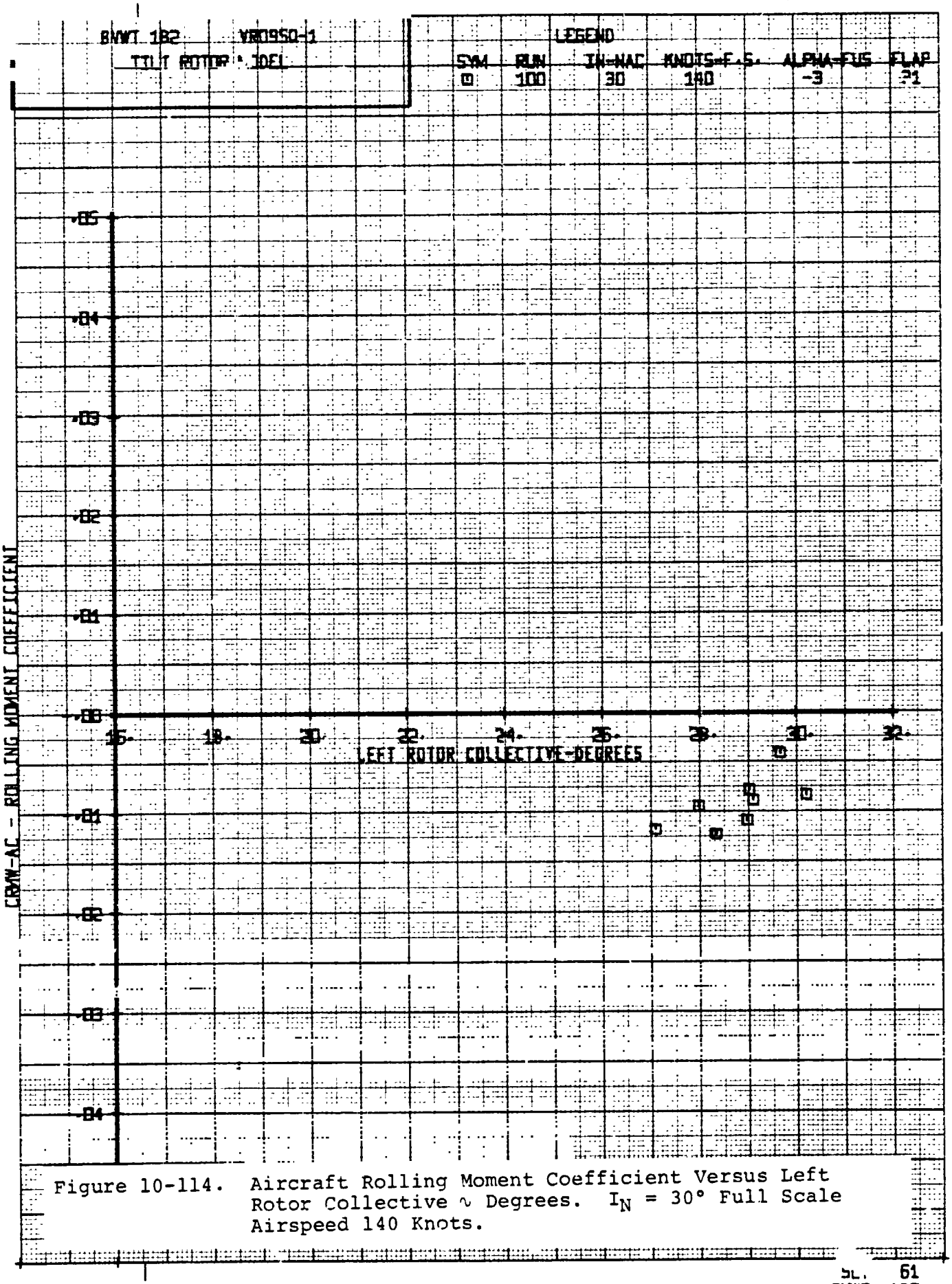


Figure 10-114. Aircraft Rolling Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

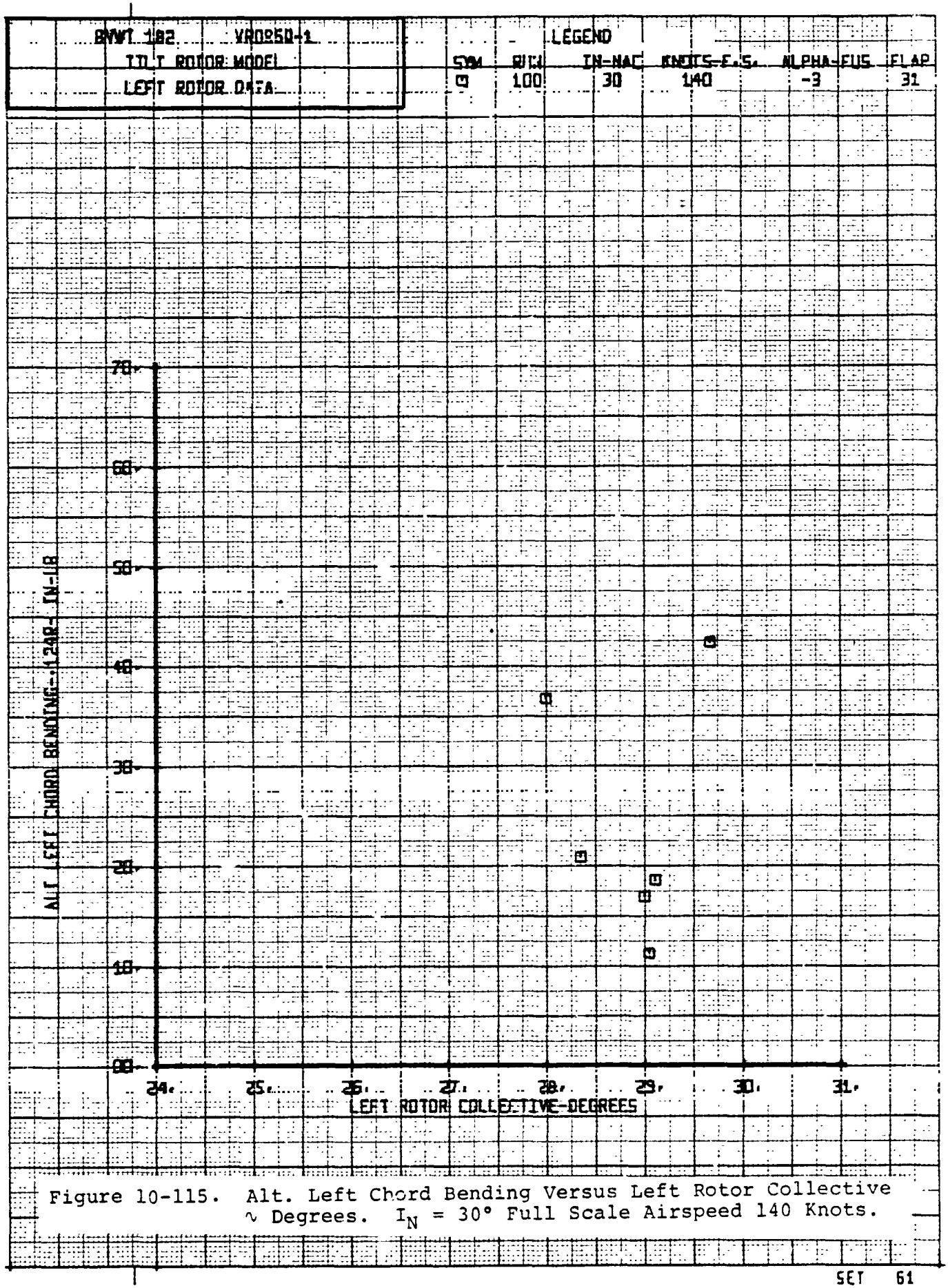


Figure 10-115. Alt. Left Chord Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

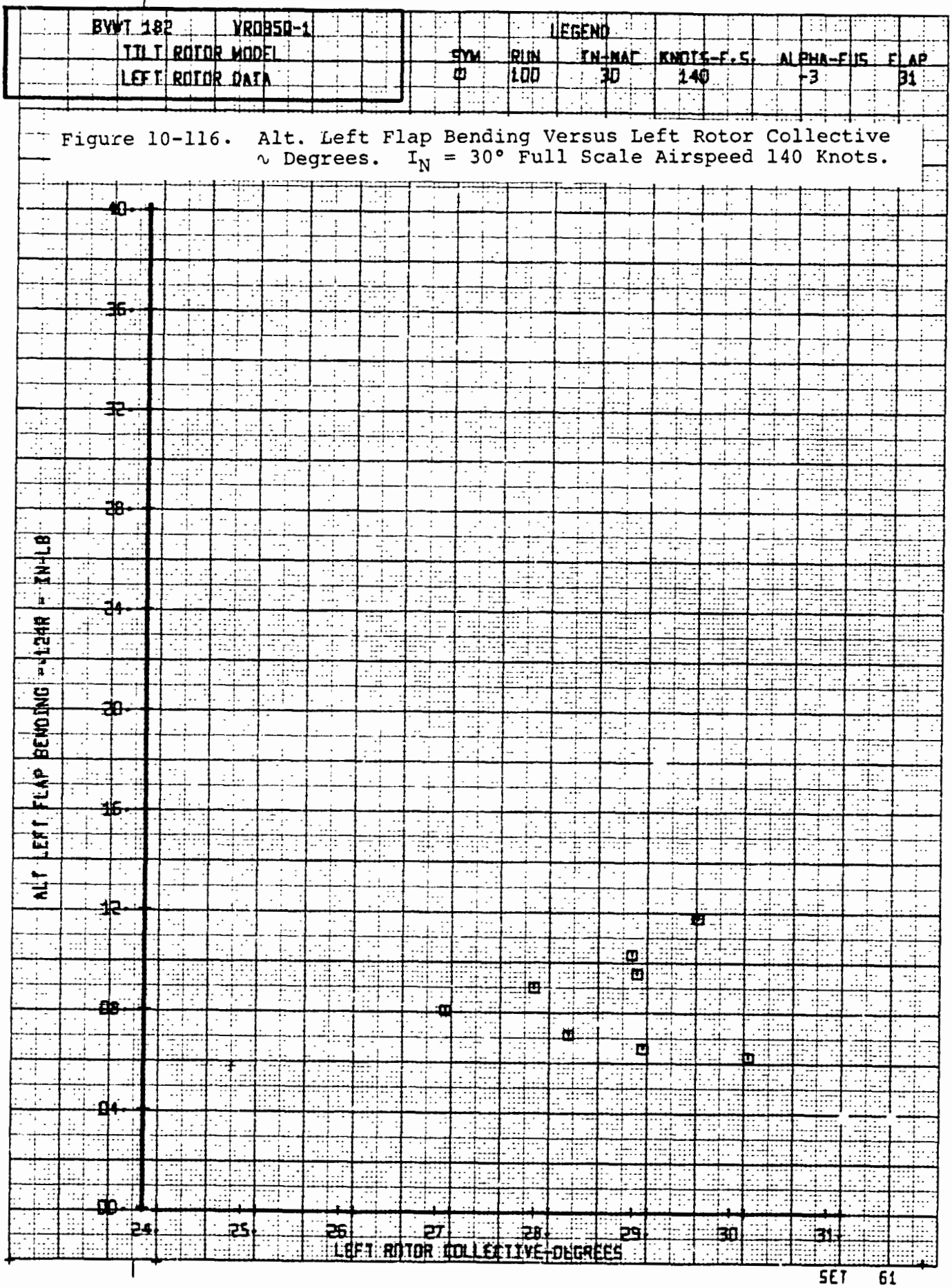


Figure 10-116. Alt. Left Flap Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

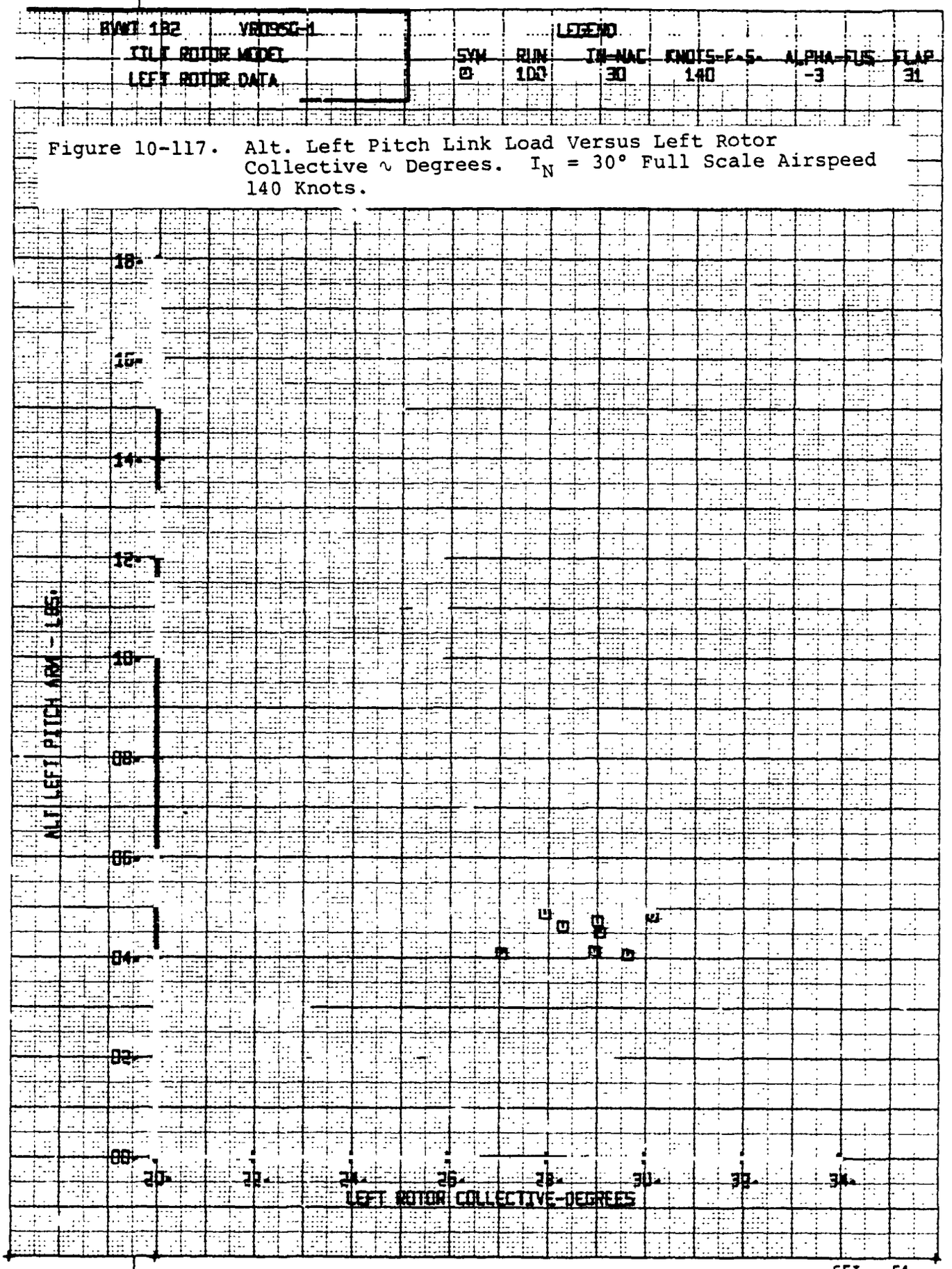


Figure 10-117. Alt. Left Pitch Link Load Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

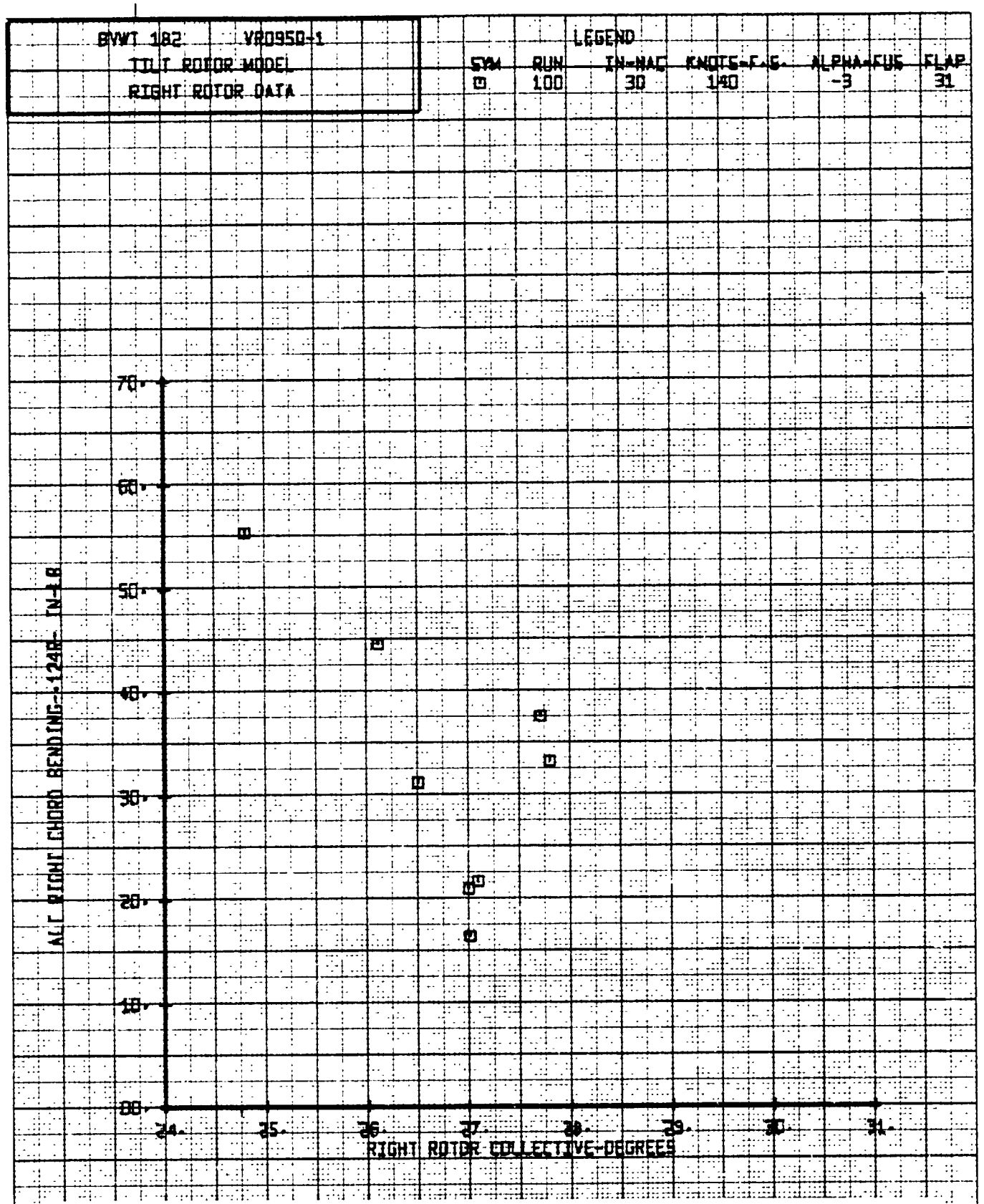


Figure 10-118. Alt. Right Chord Bending Versus Right Rotor Collective ∿ Degrees. $I_{..}$ = 30° Full Scale Airspeed 140 Knots.

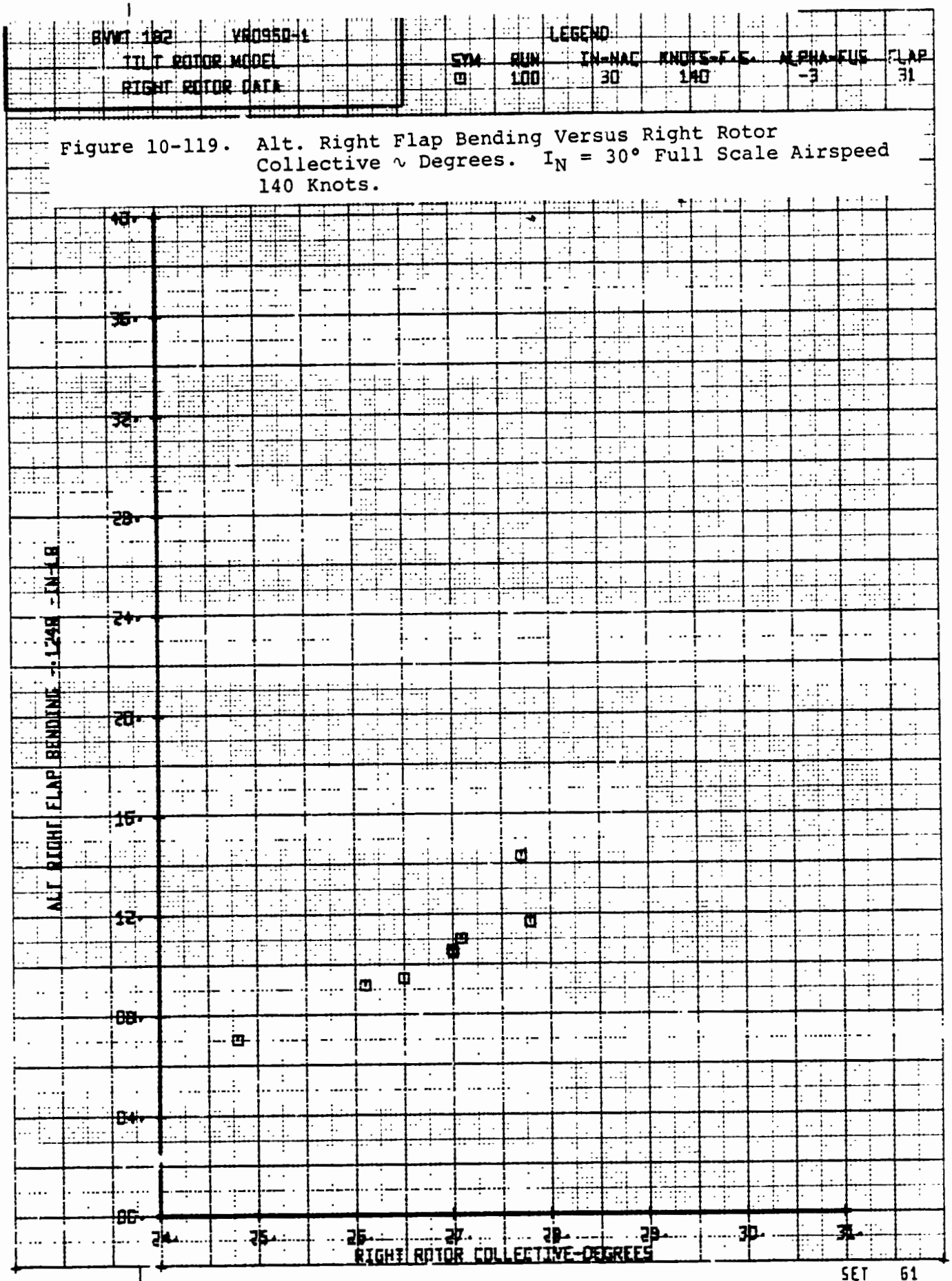


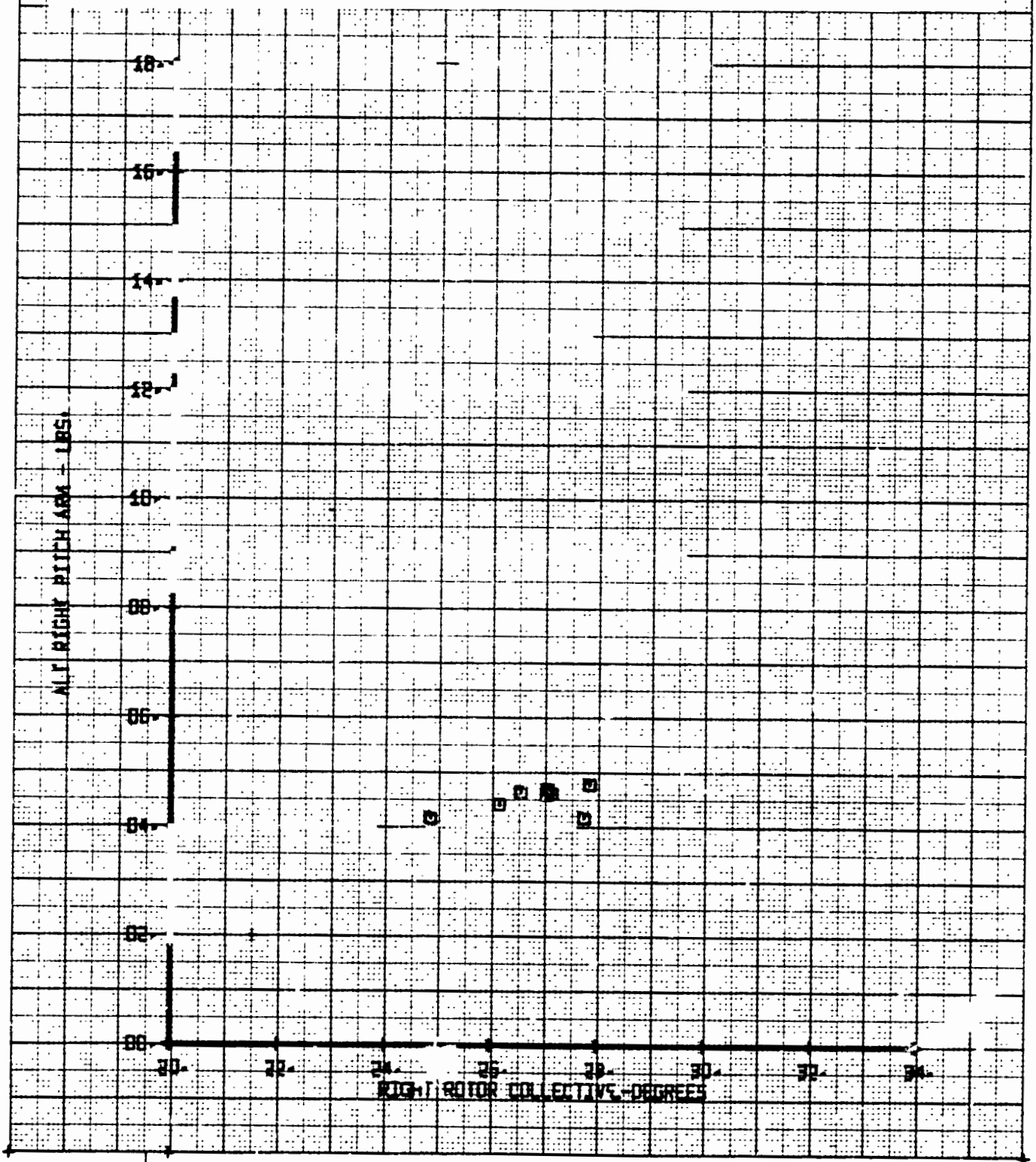
Figure 10-119. Alt. Right Flap Bending Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 YR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	100	30	140	-3	31

Figure 10-120. Alt. Right Pitch Link Load Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.



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SET 61
BVWT 182

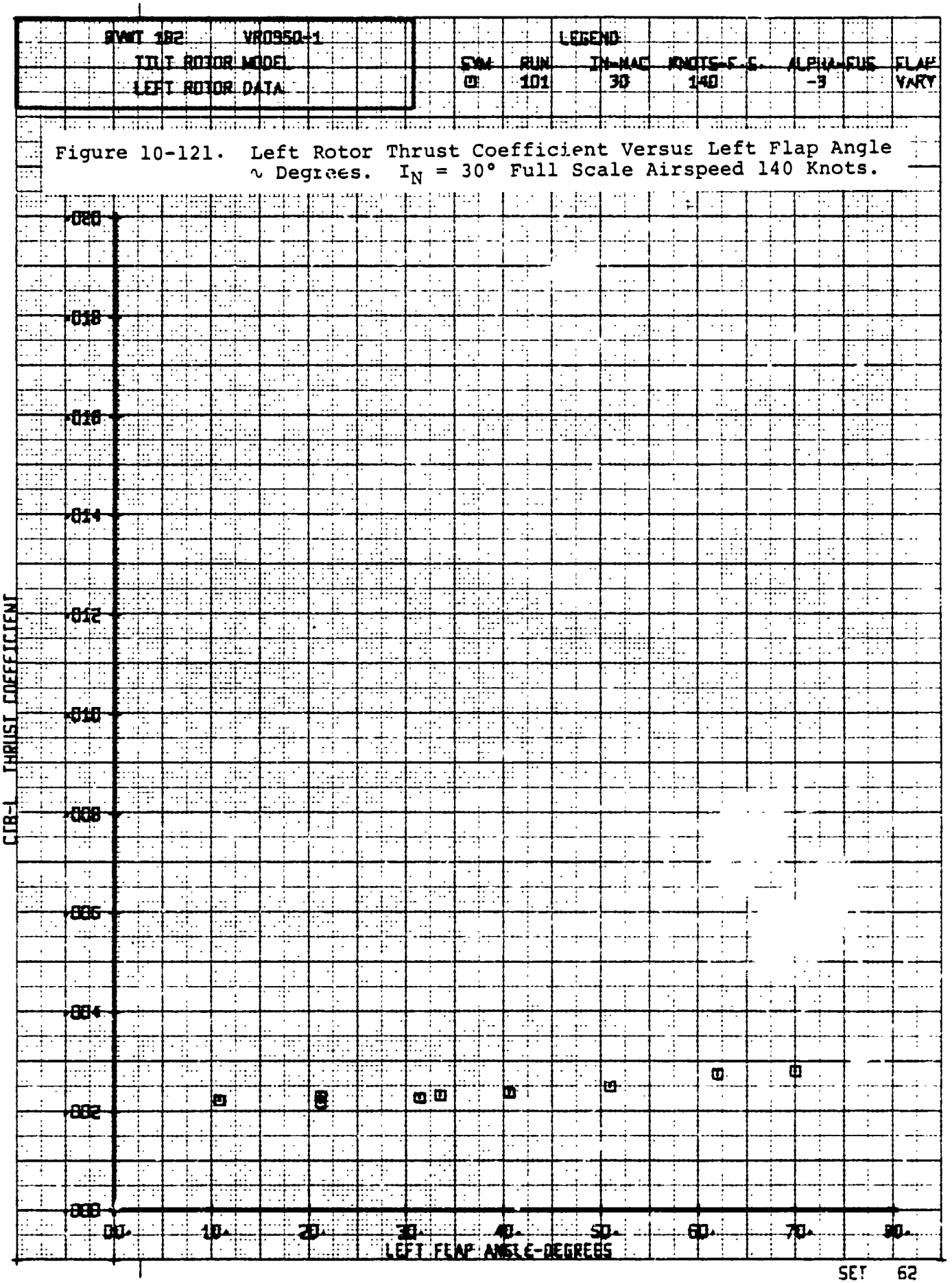


Figure 10-121. Left Rotor Thrust Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

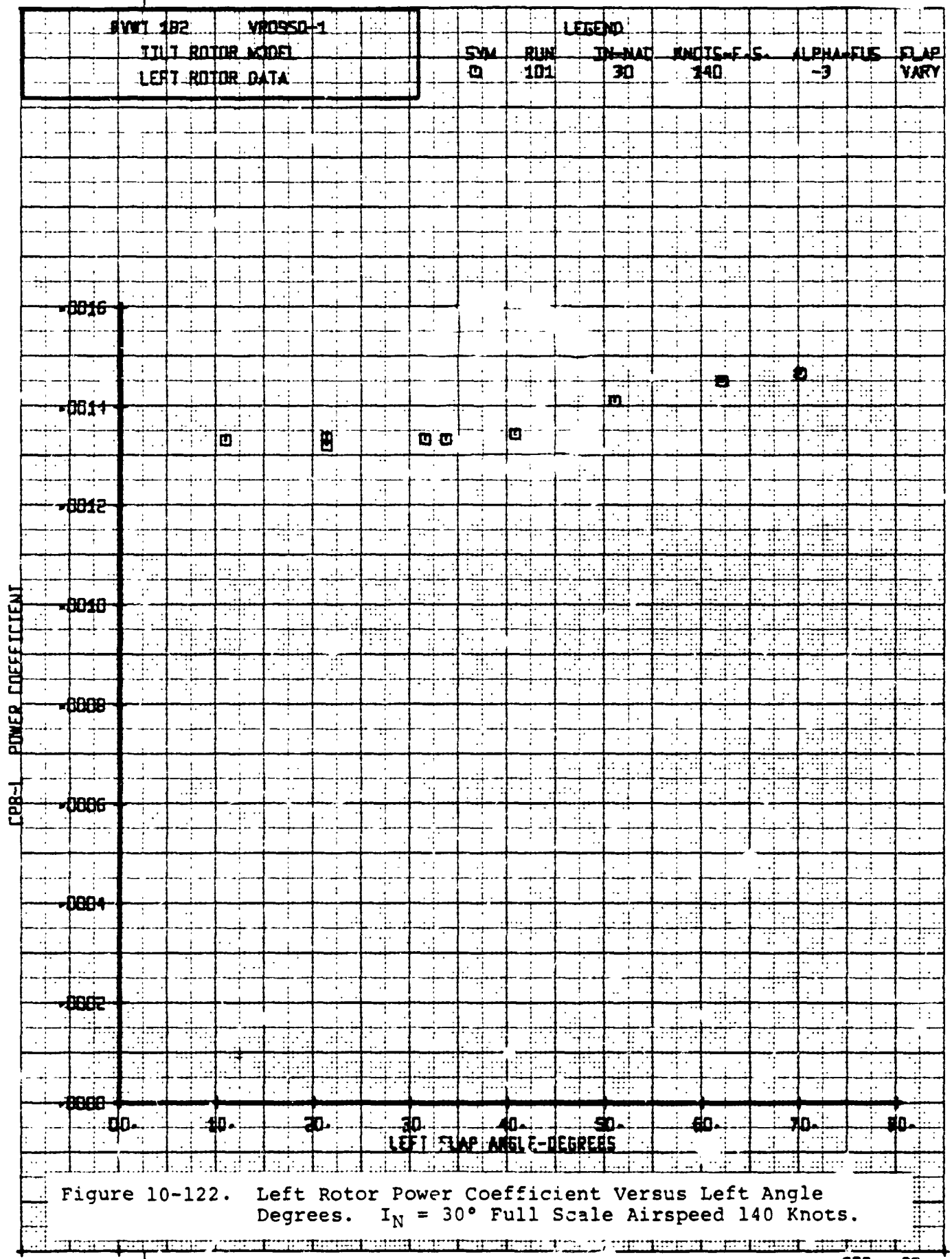


Figure 10-122. Left Rotor Power Coefficient Versus Left Angle Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

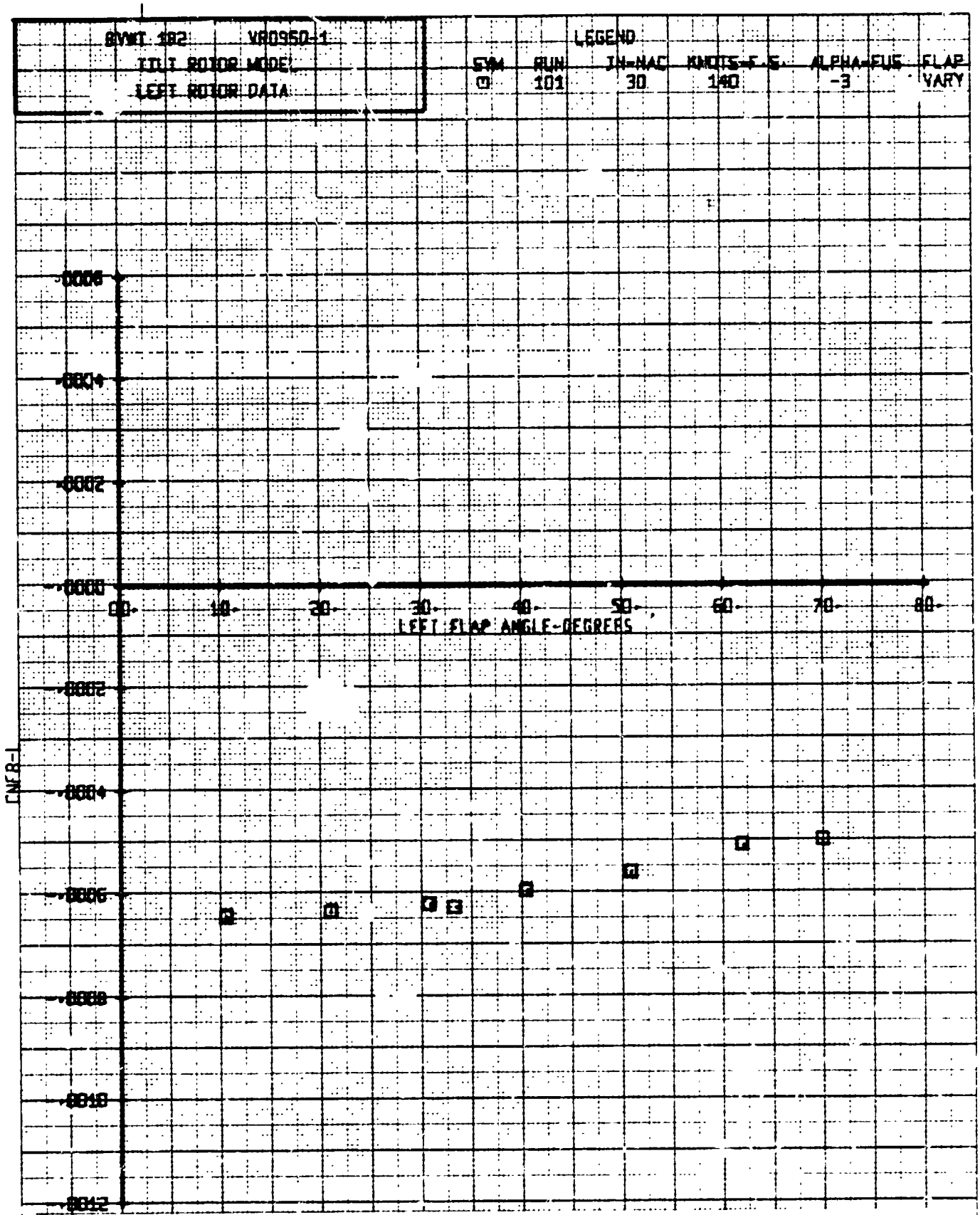


Figure 10-123. Left Rotor Normal Force Coefficient versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

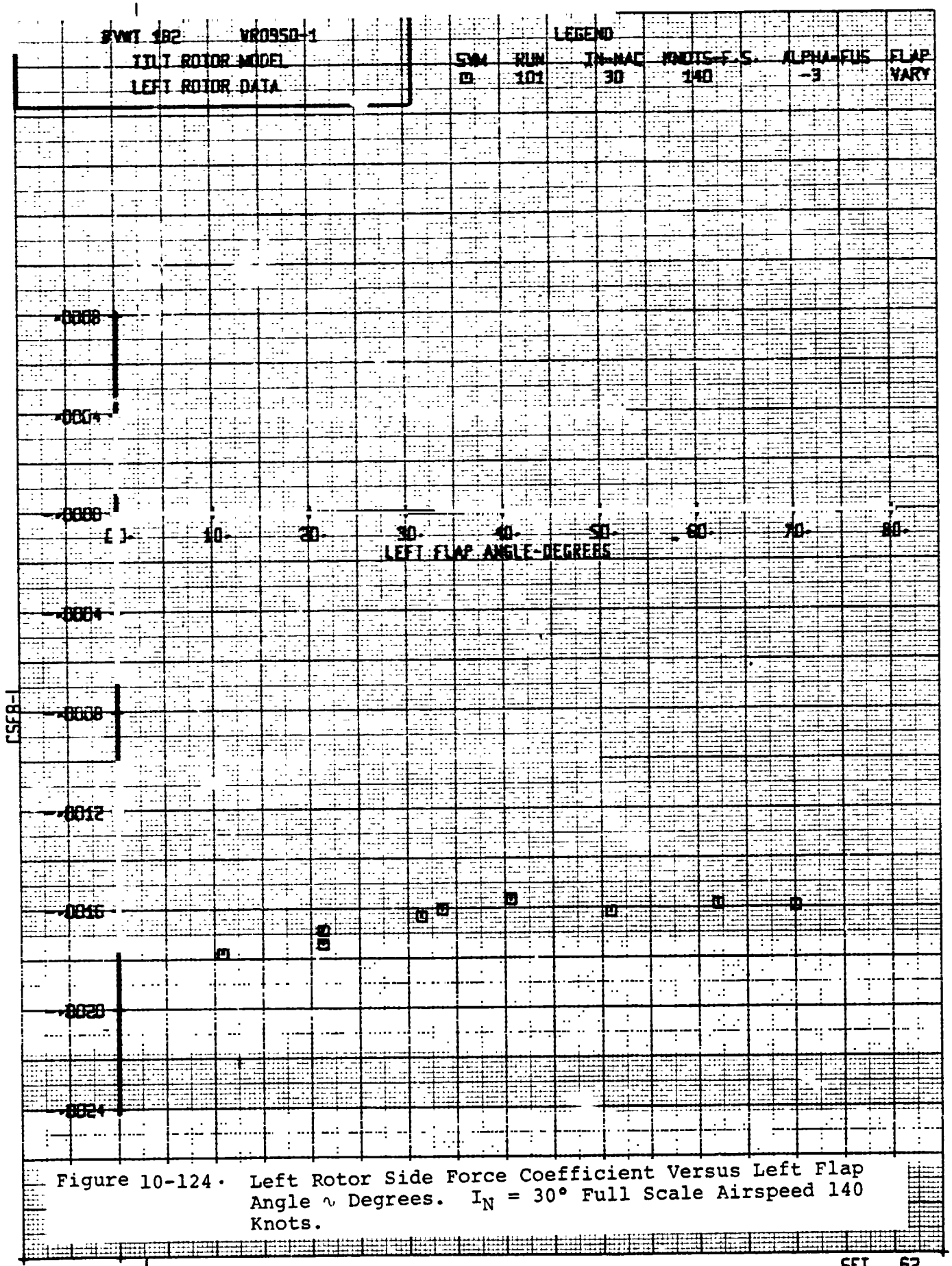


Figure 10-124. Left Rotor Side Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

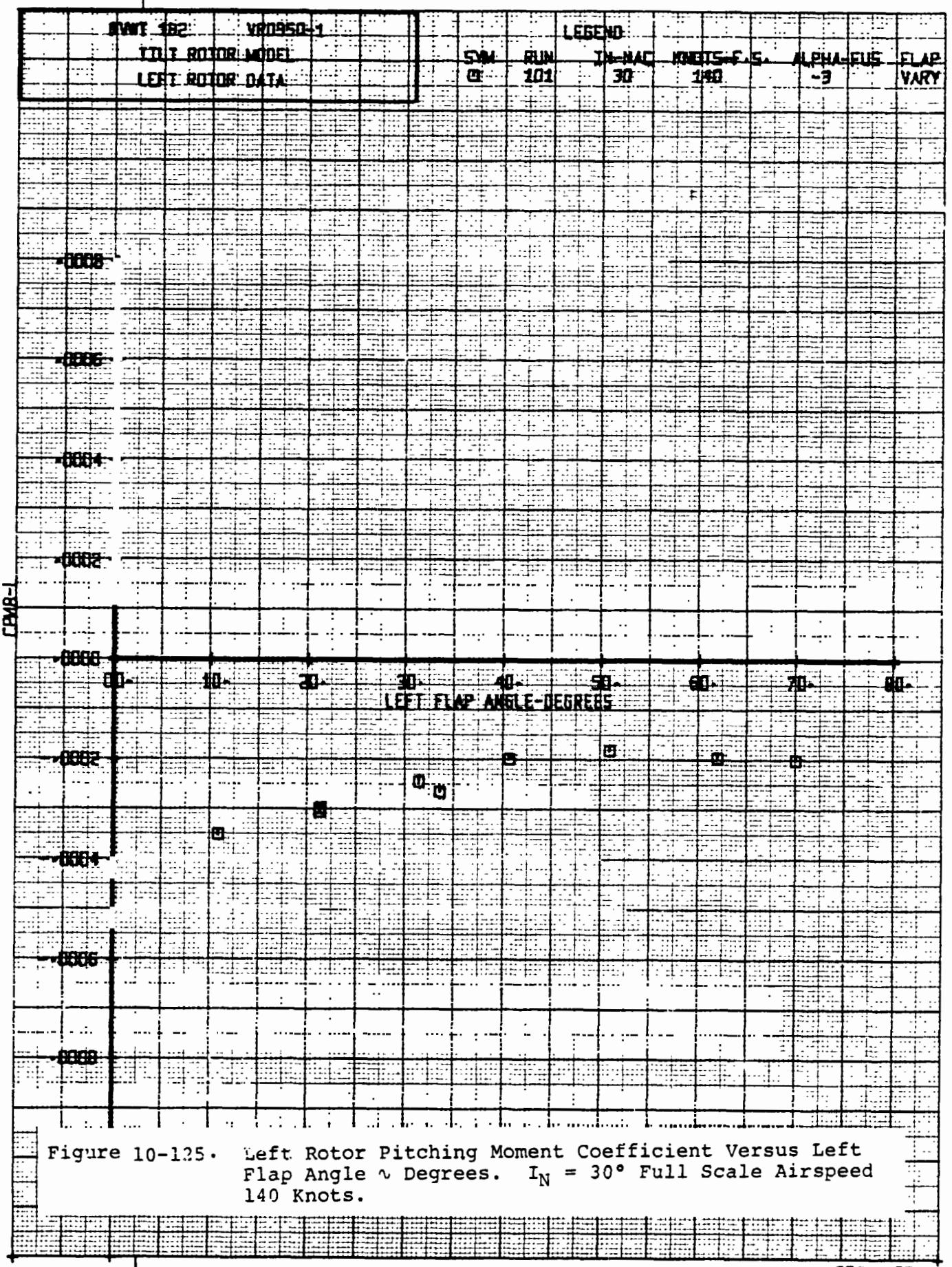


Figure 10-125. Left Rotor Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

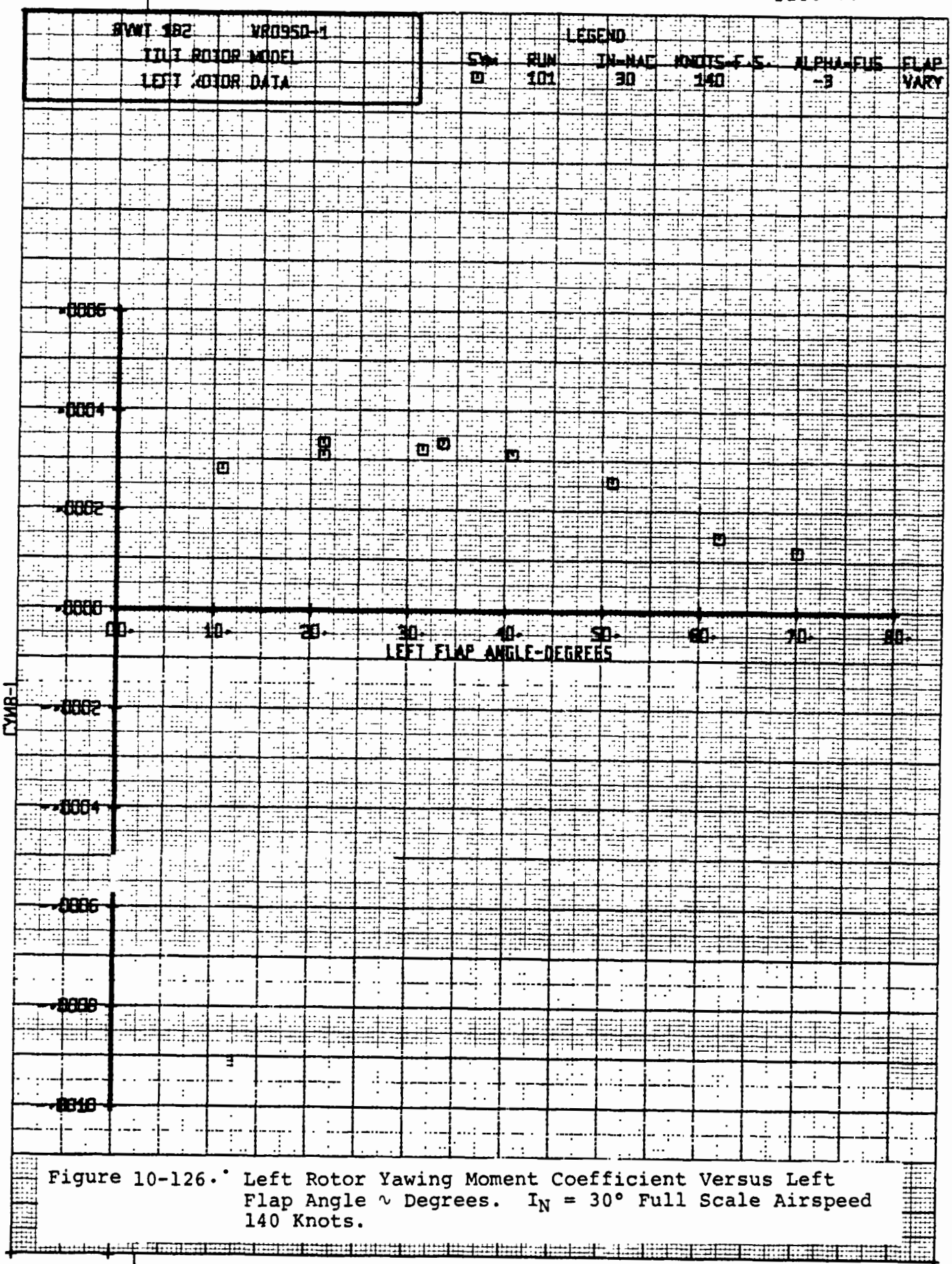


Figure 10-126. Left Rotor Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

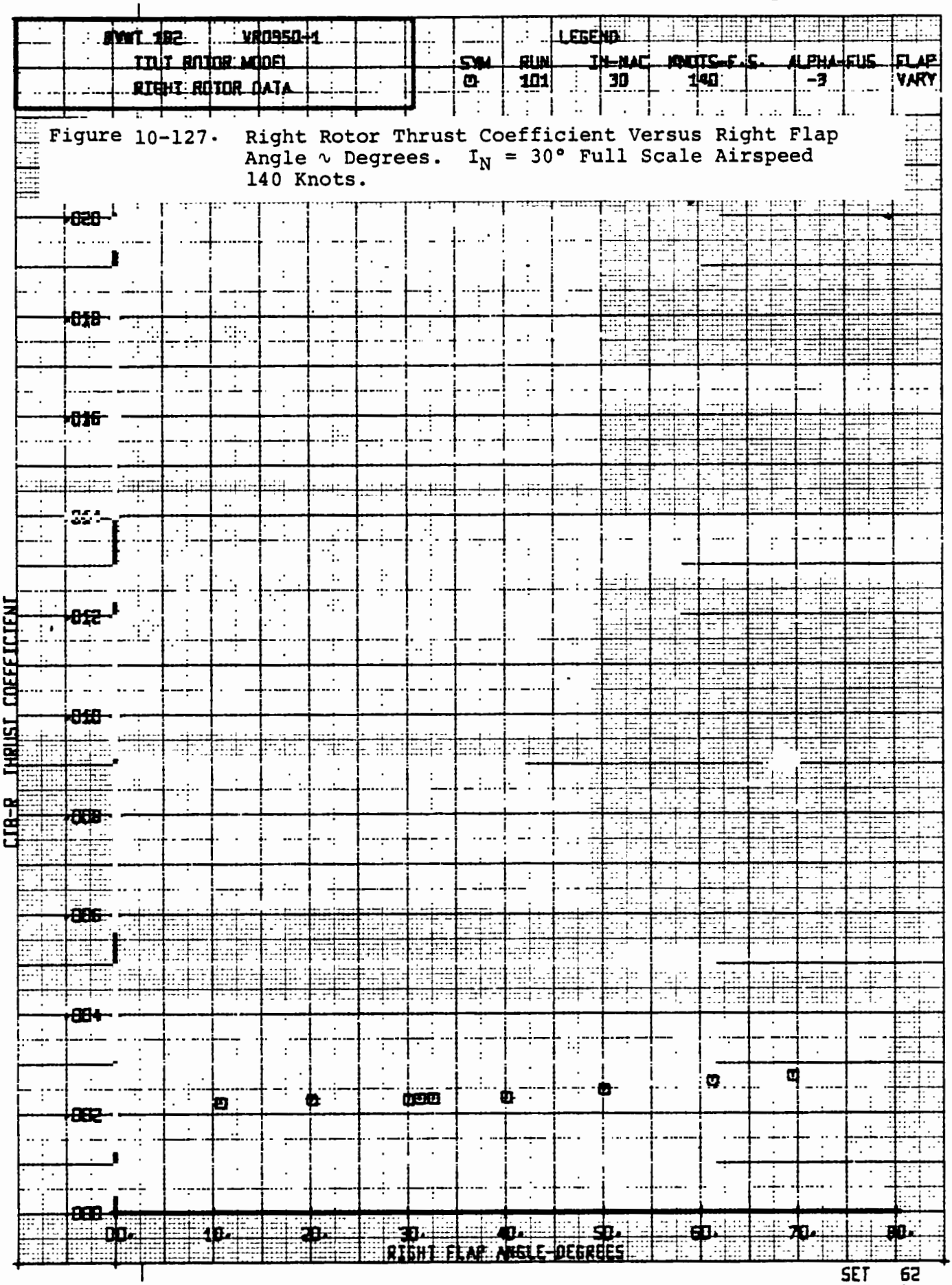


Figure 10-127. Right Rotor Thrust Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

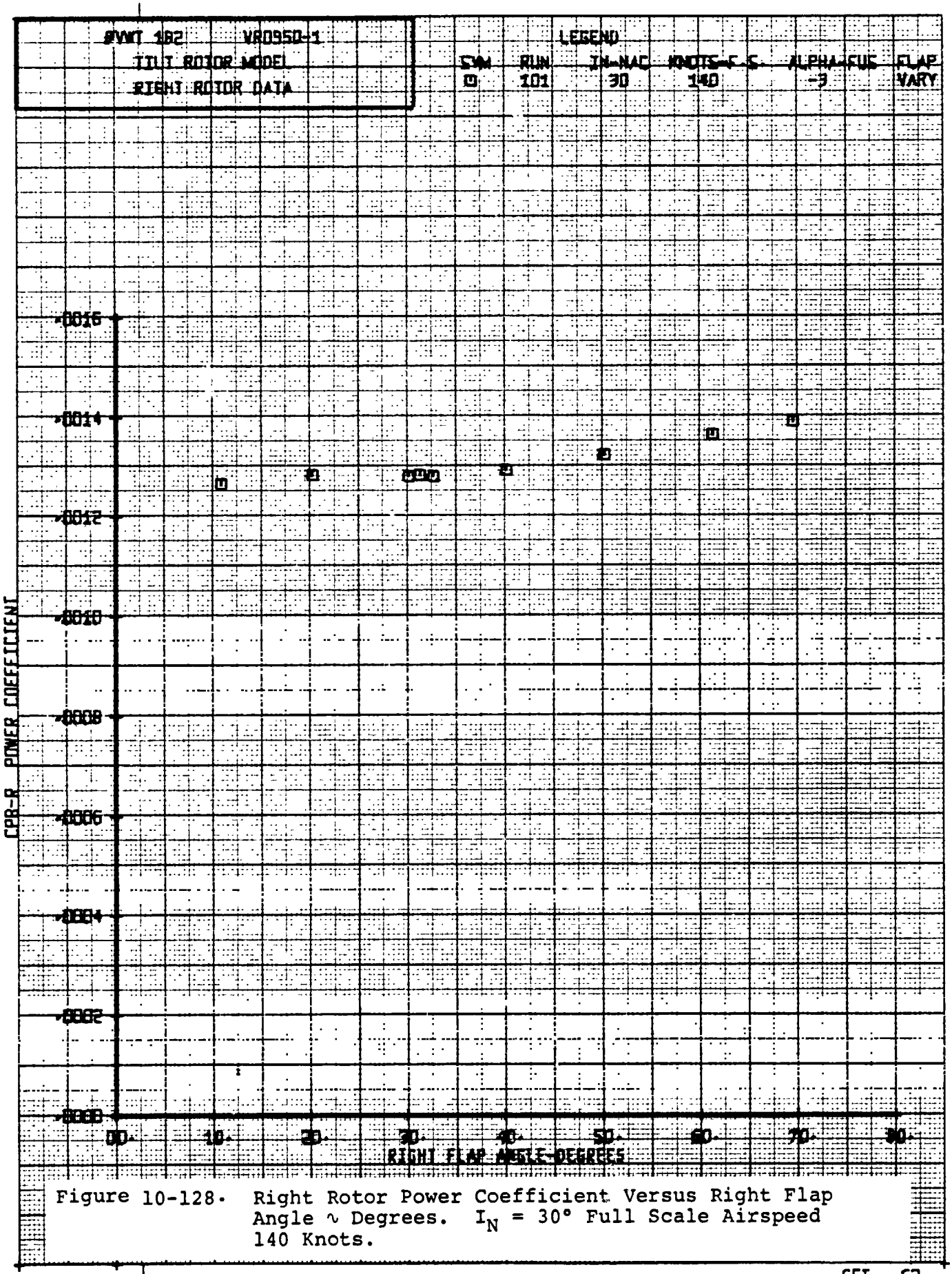


Figure 10-128. Right Rotor Power Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

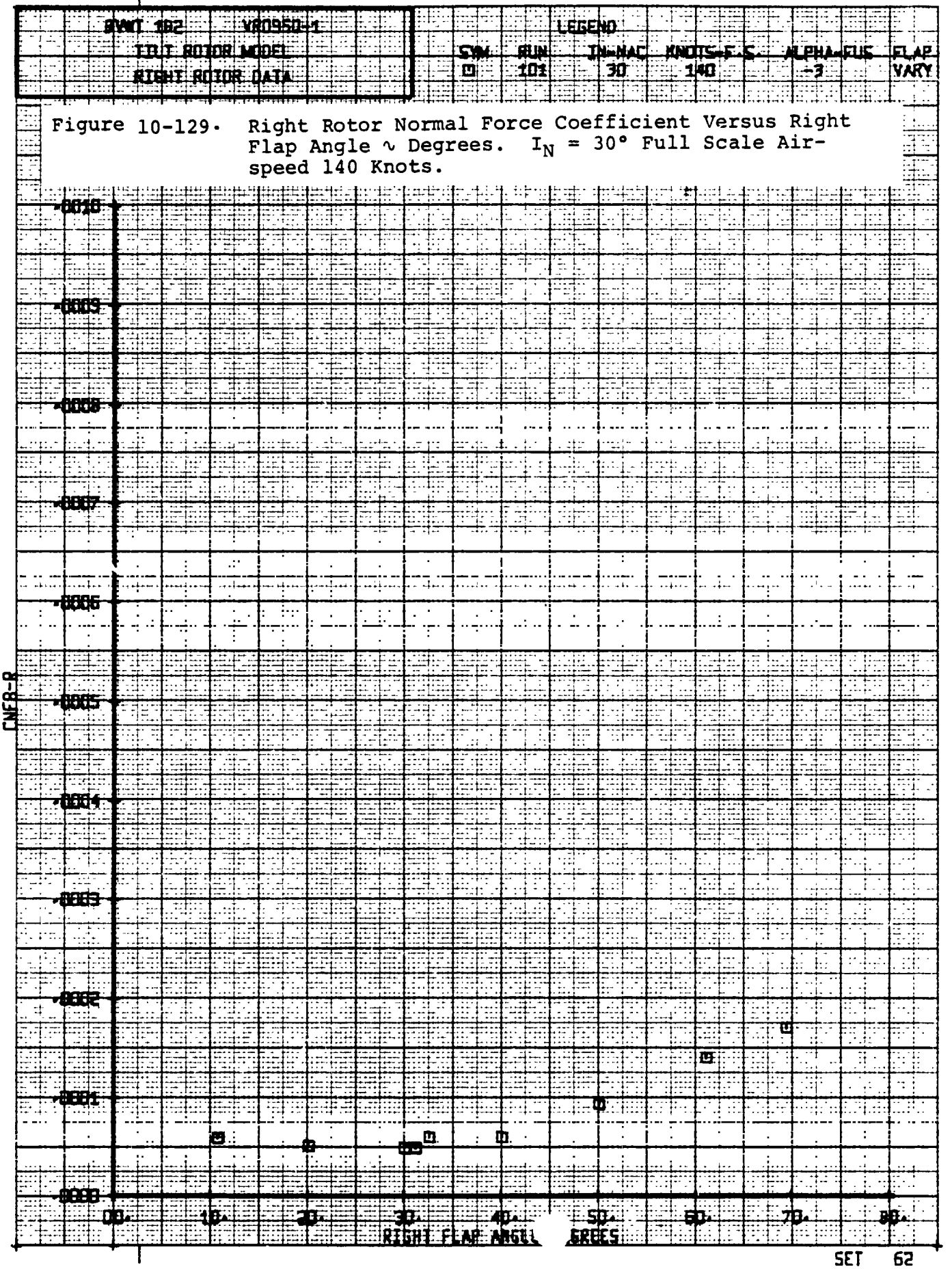


Figure 10-129. Right Rotor Normal Force Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

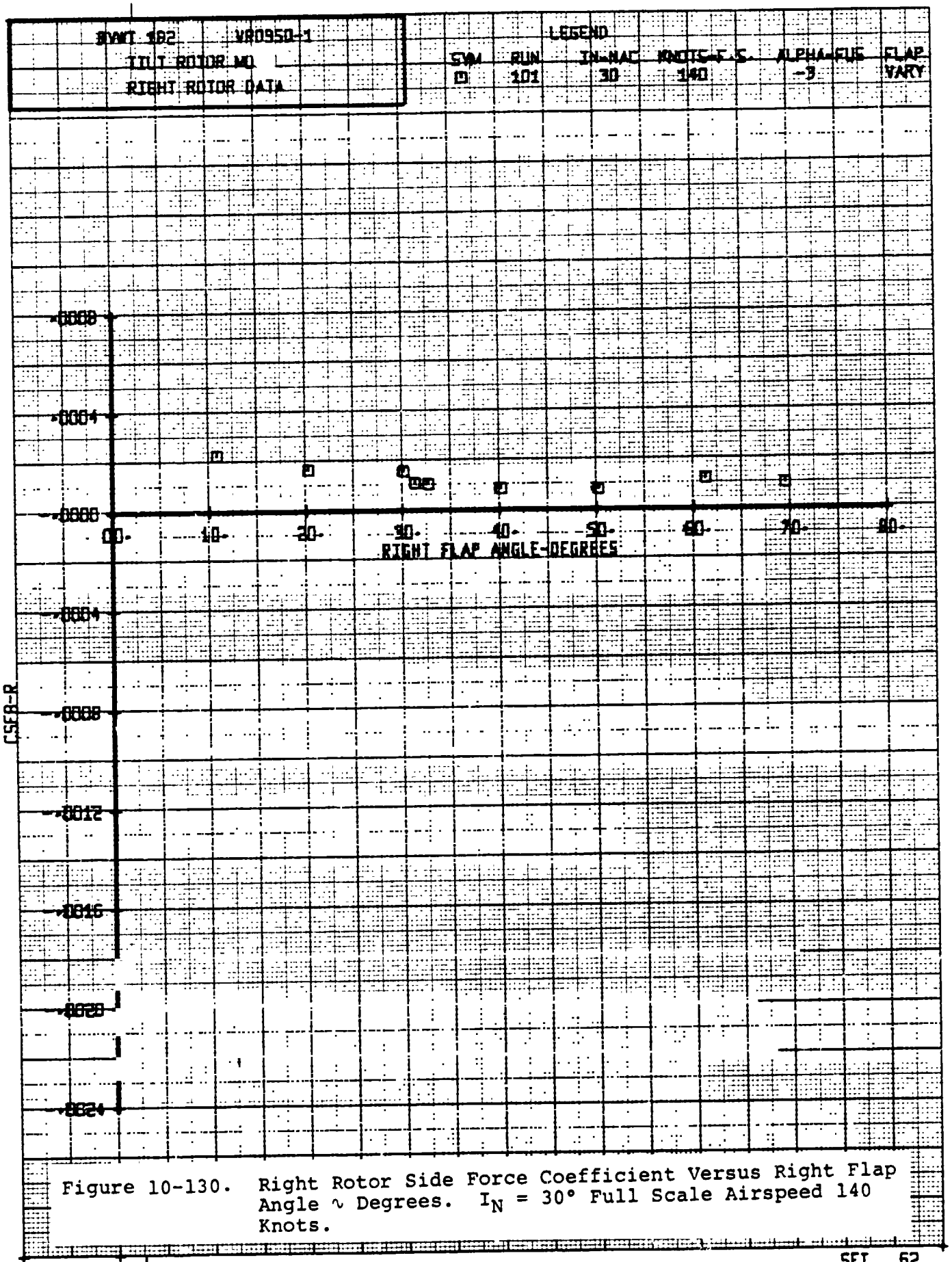


Figure 10-130. Right Rotor Side Force Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

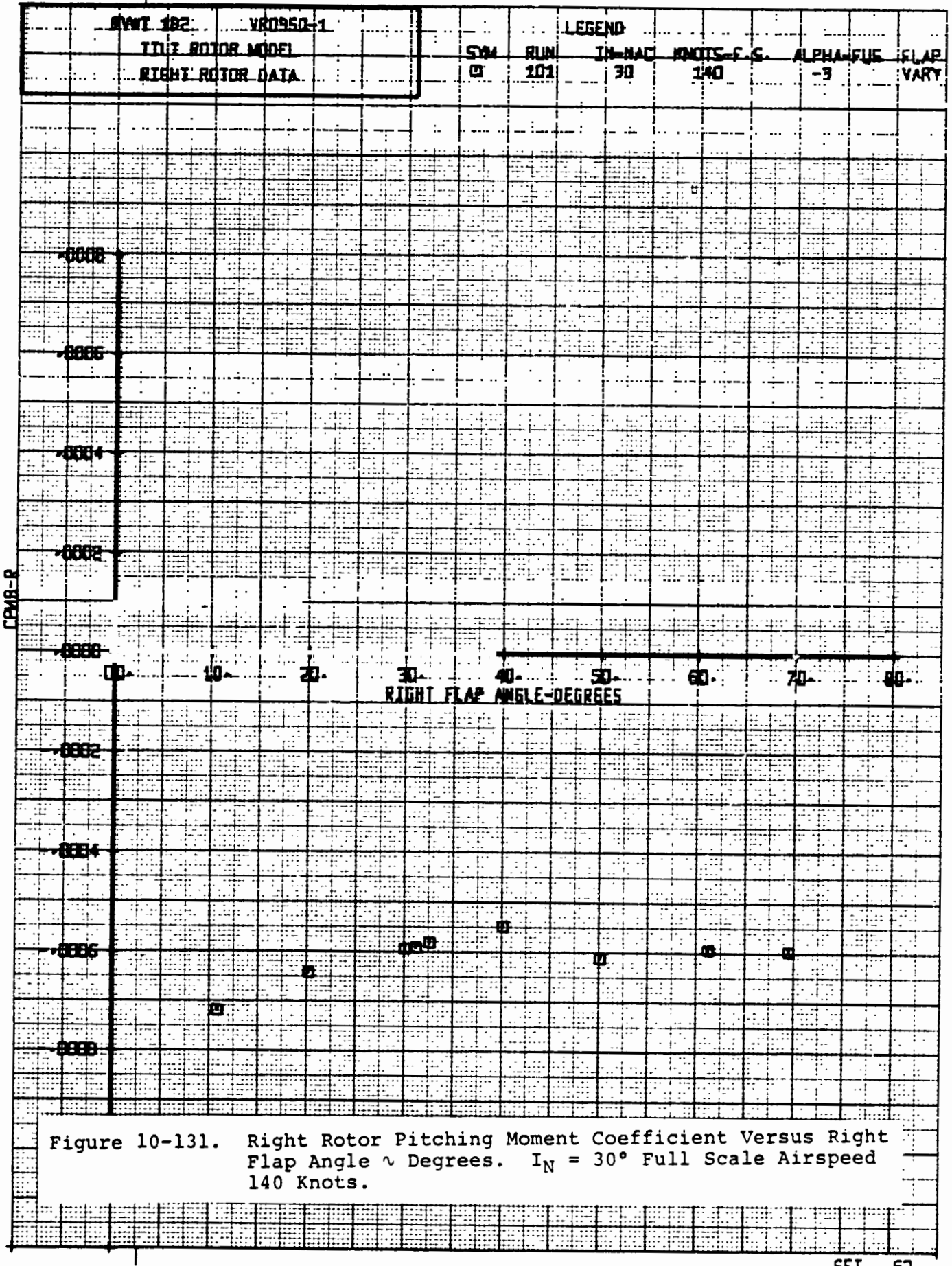


Figure 10-131. Right Rotor Pitching Moment Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

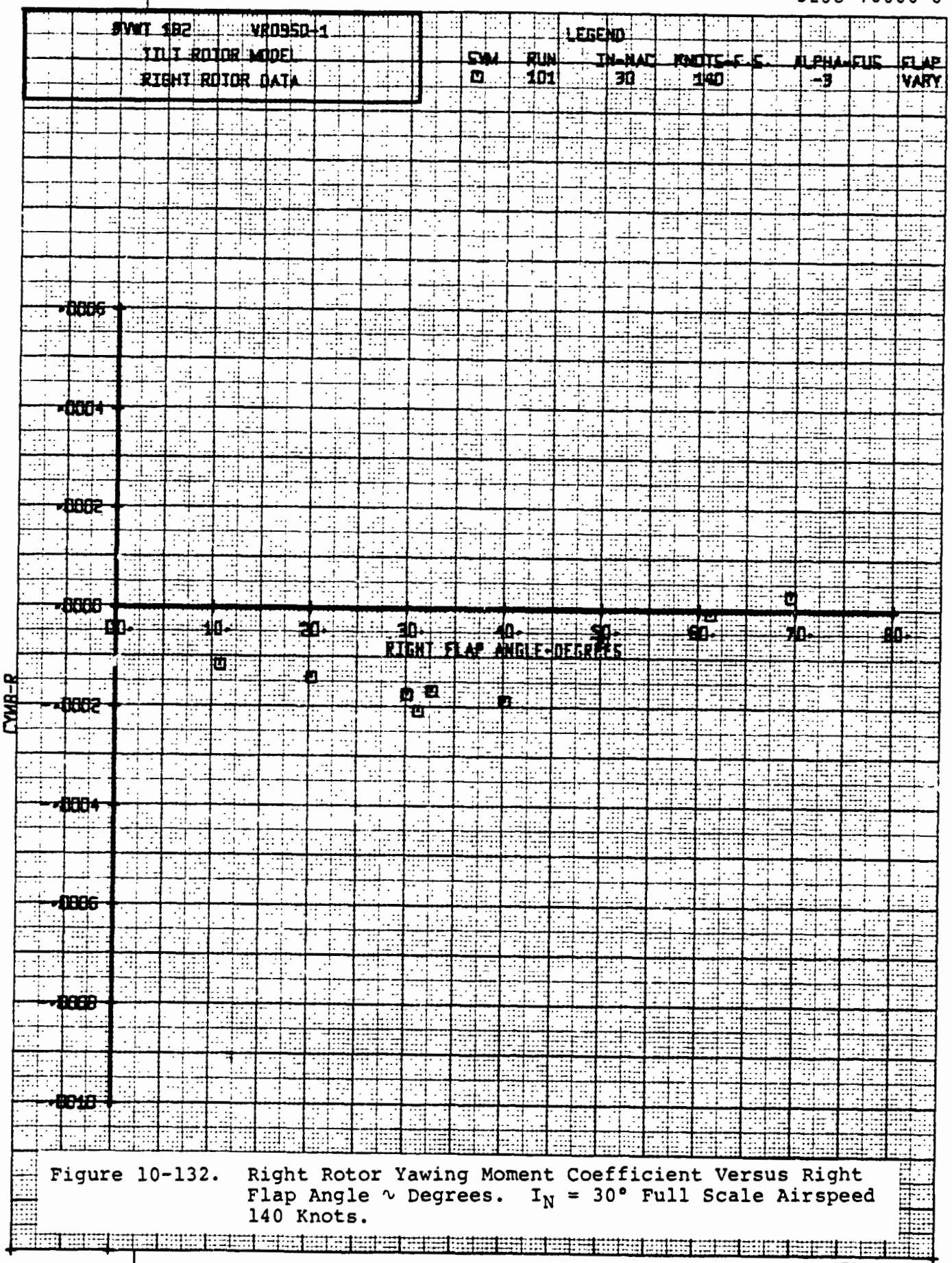


Figure 10-132. Right Rotor Yawing Moment Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

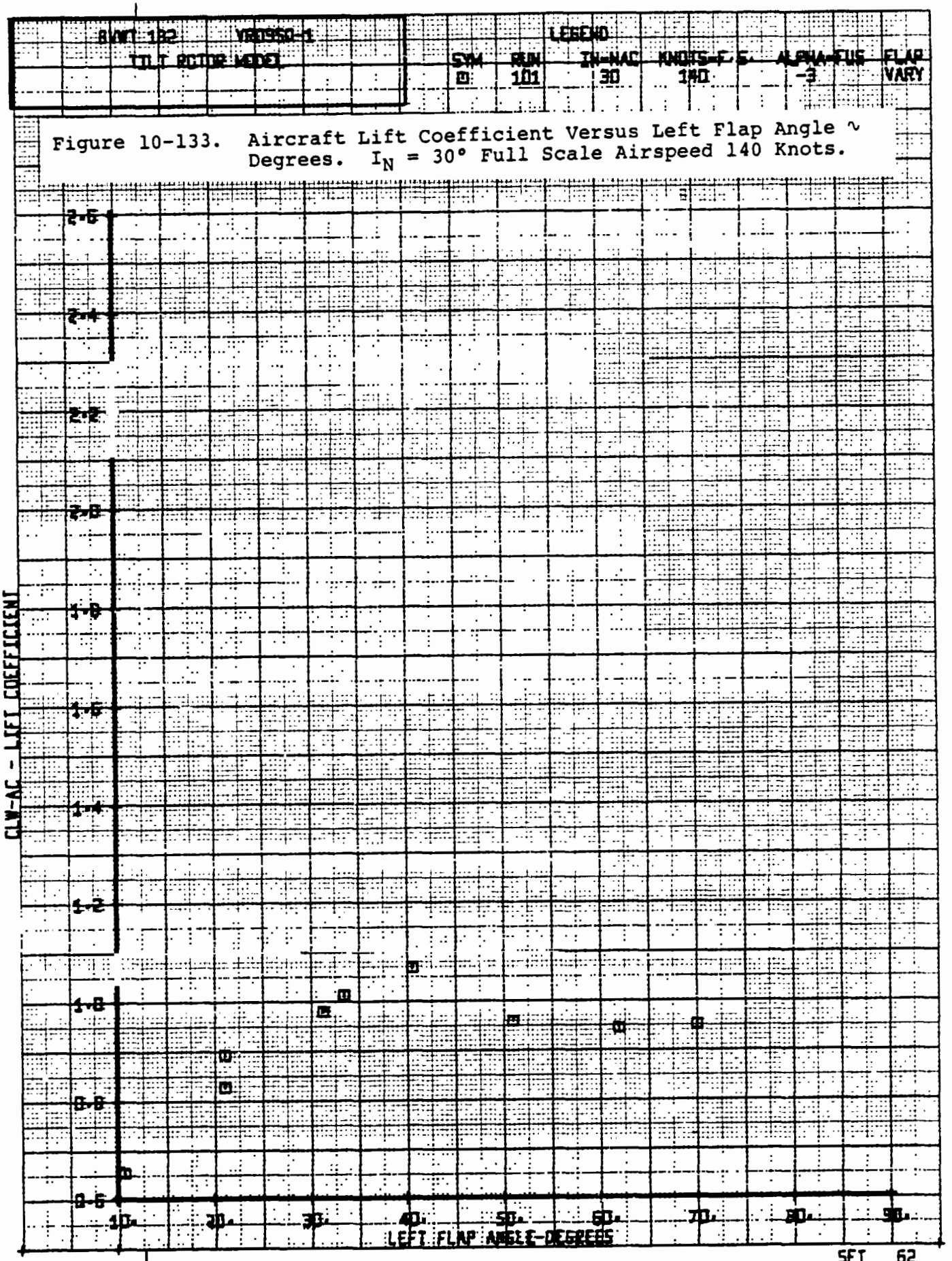


Figure 10-133. Aircraft Lift Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

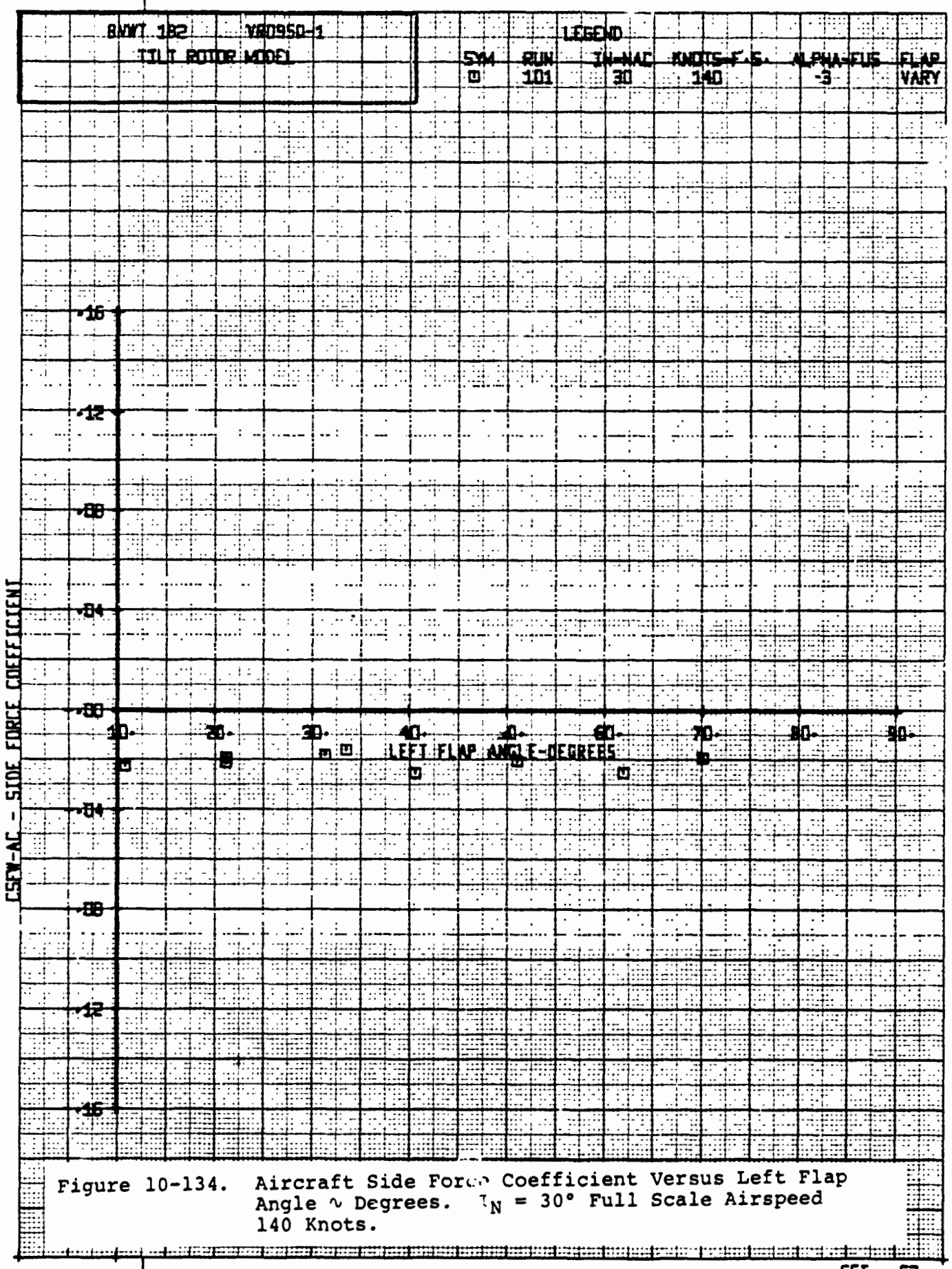


Figure 10-134. Aircraft Side Force Coefficient Versus Left Flap Angle ∿ Degrees. i_N = 30° Full Scale Airspeed 140 Knots.

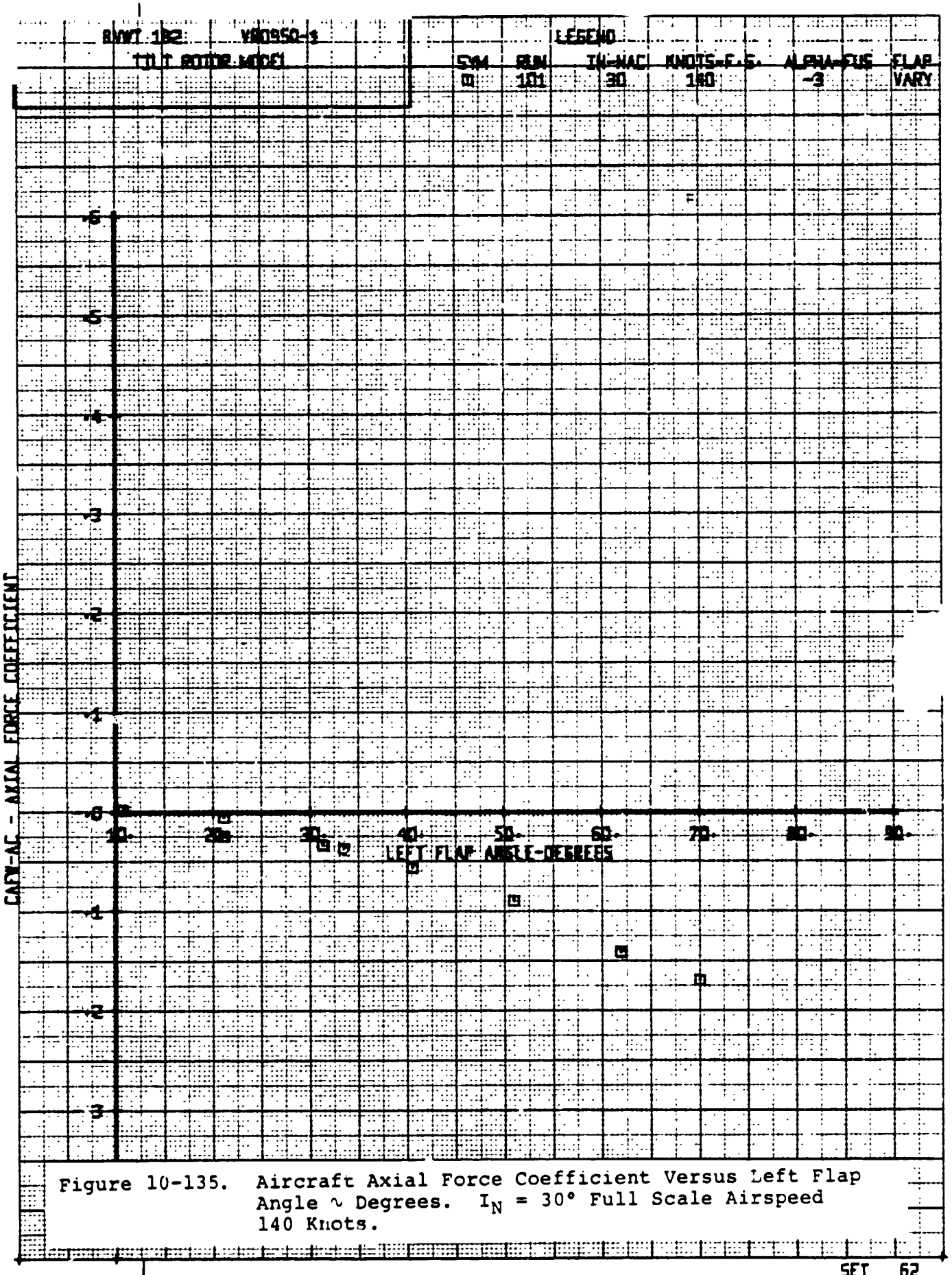


Figure 10-135. Aircraft Axial Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

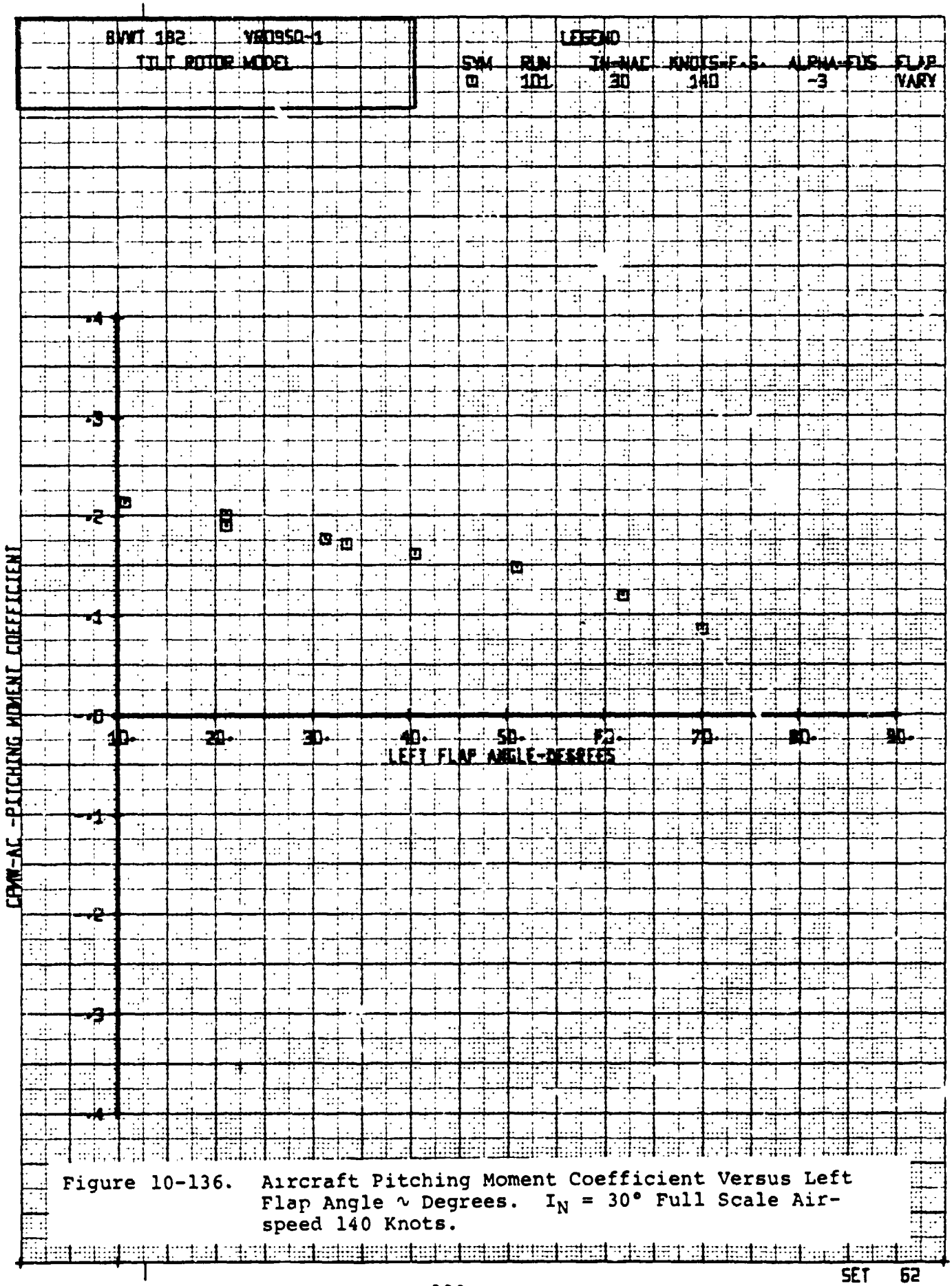


Figure 10-136. Aircraft Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

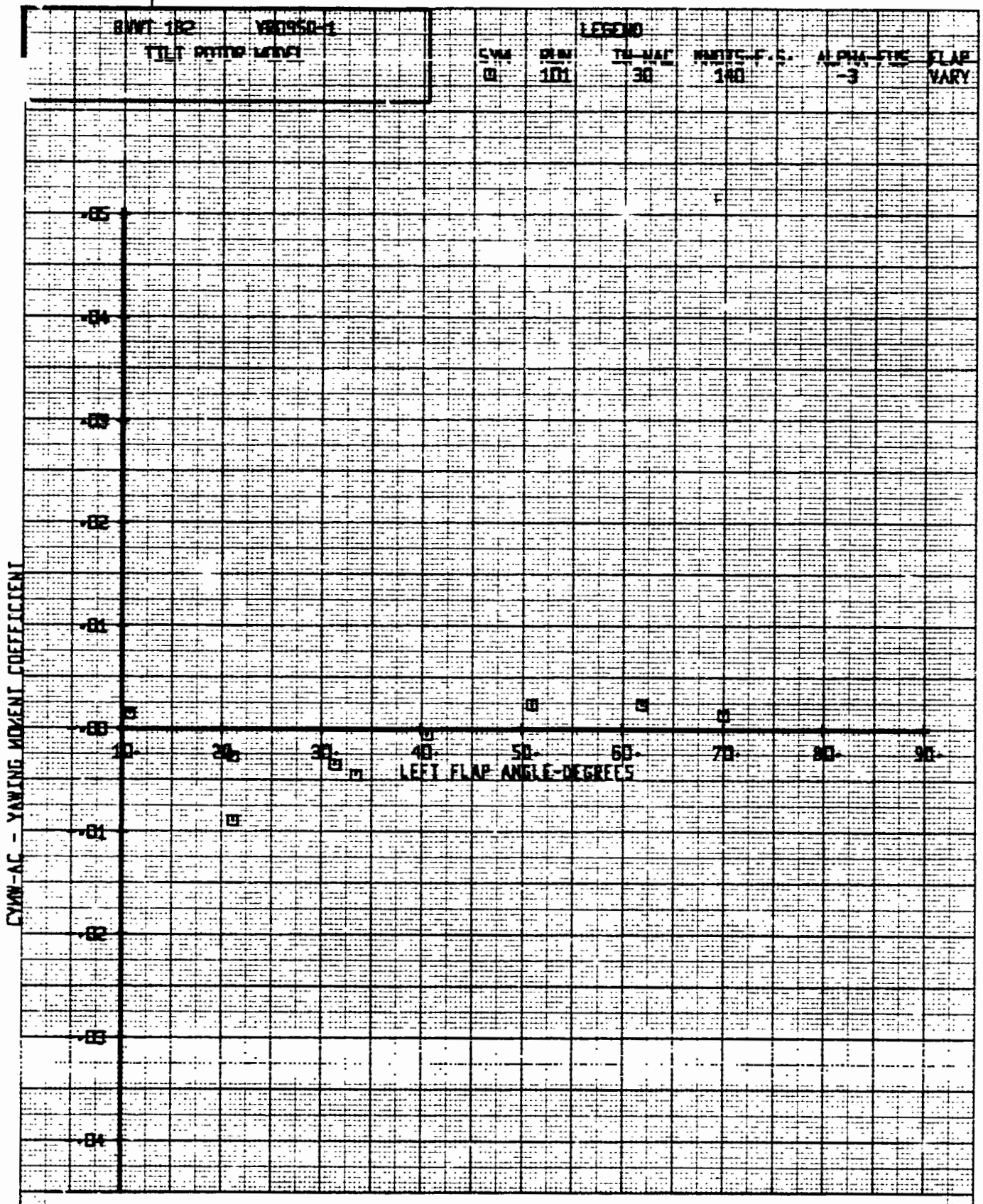


Figure 10-137. Aircraft Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

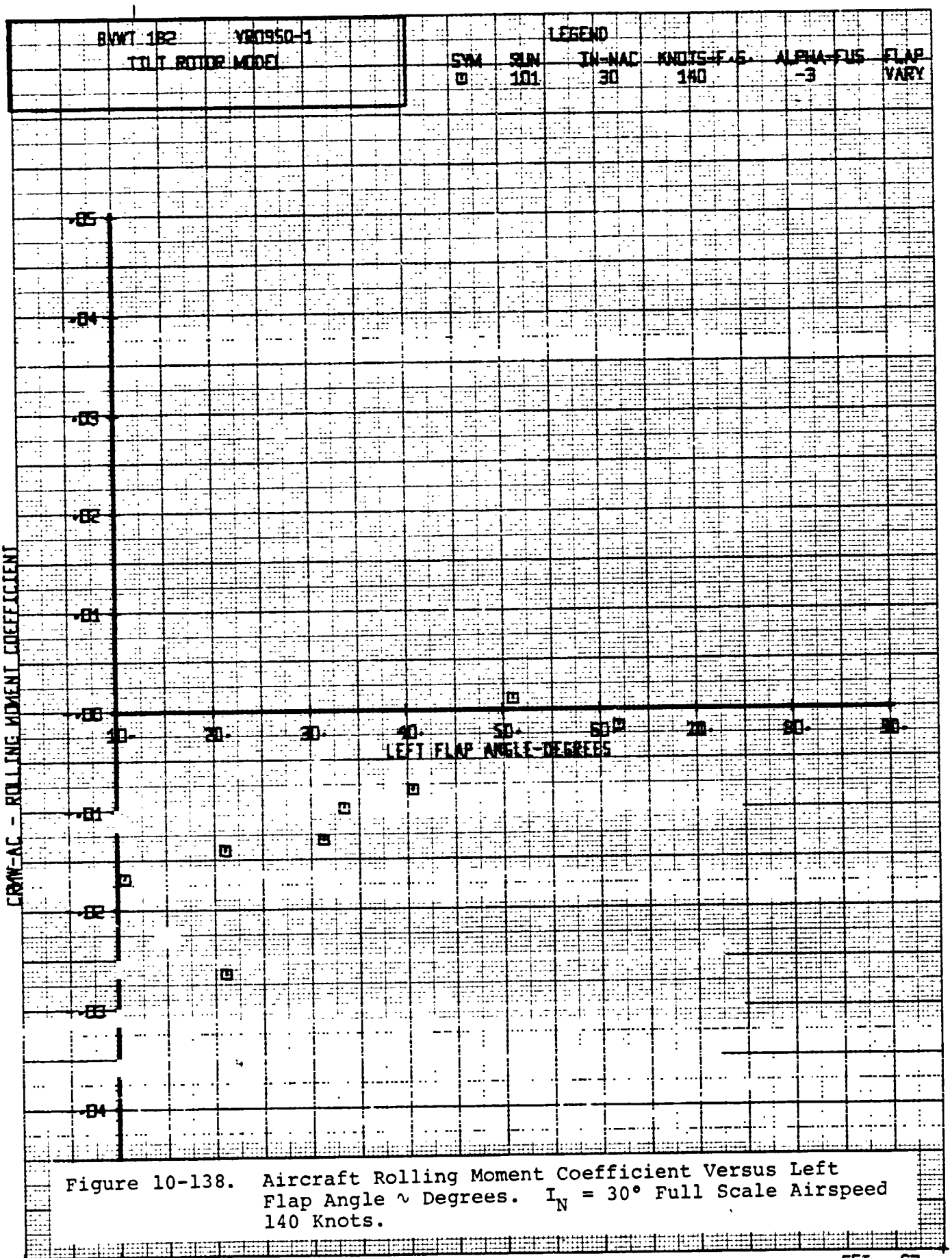


Figure 10-138. Aircraft Rolling Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

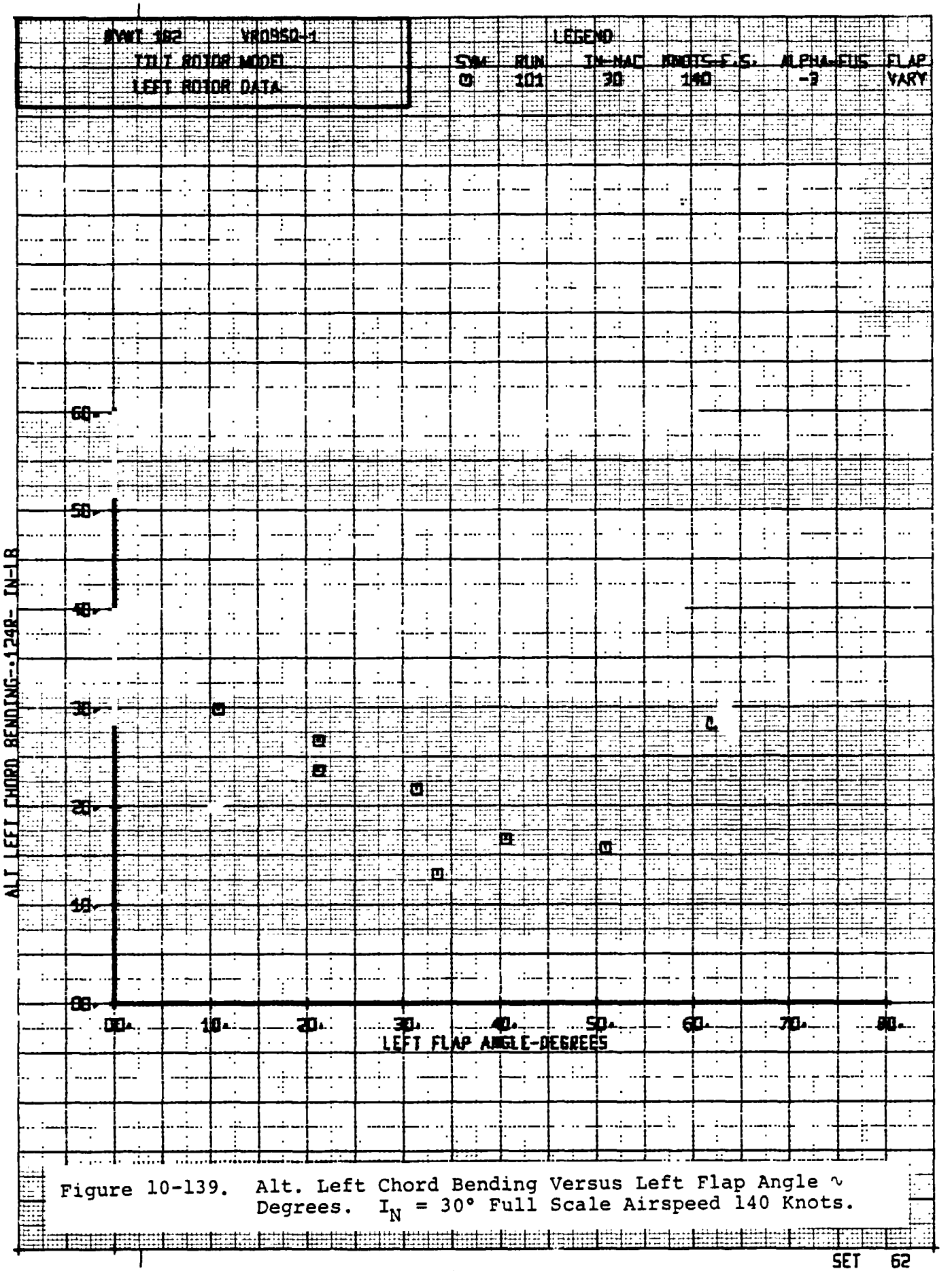


Figure 10-139. Alt. Left Chord Bending Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

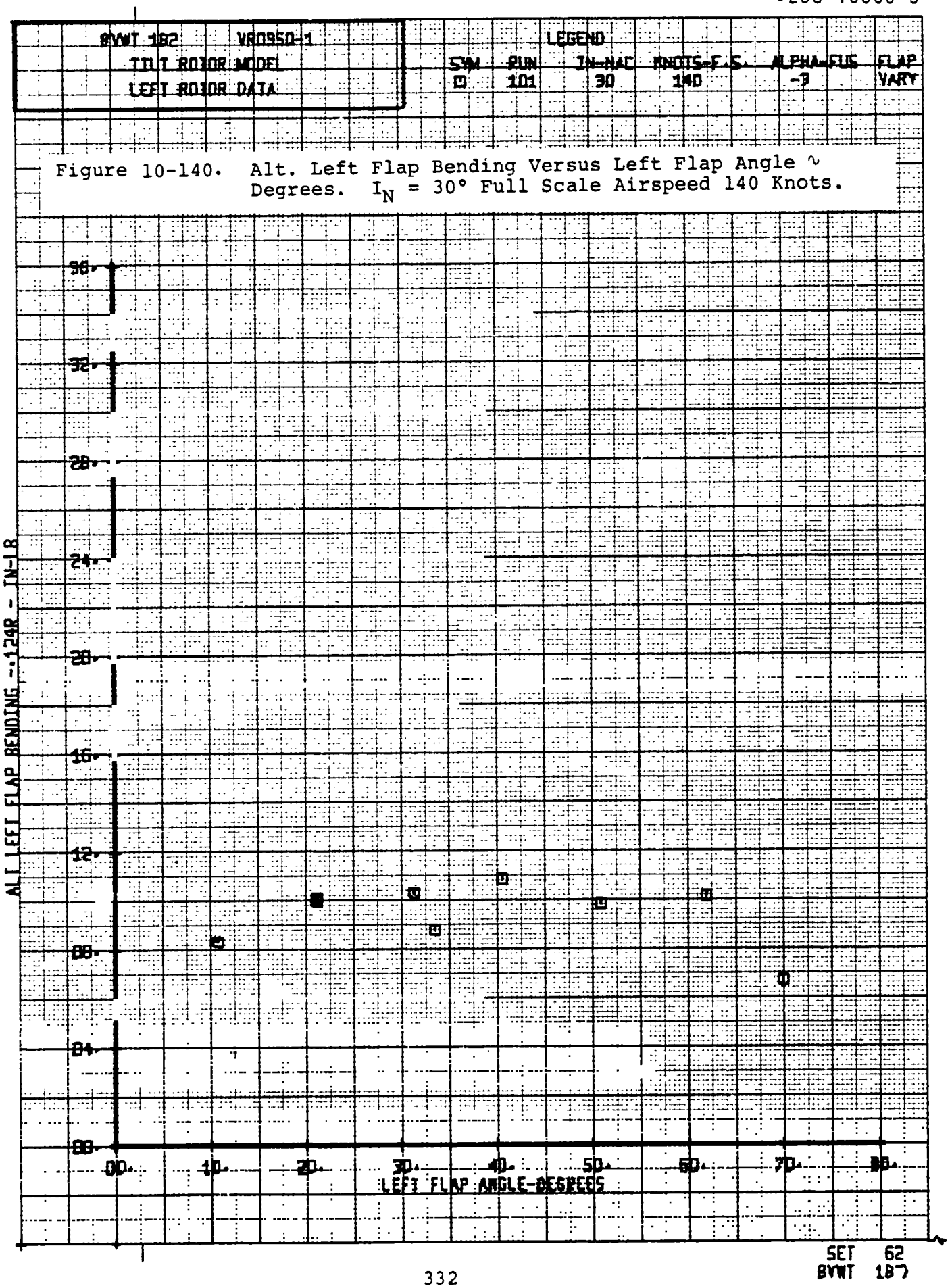


Figure 10-140. Alt. Left Flap Bending Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

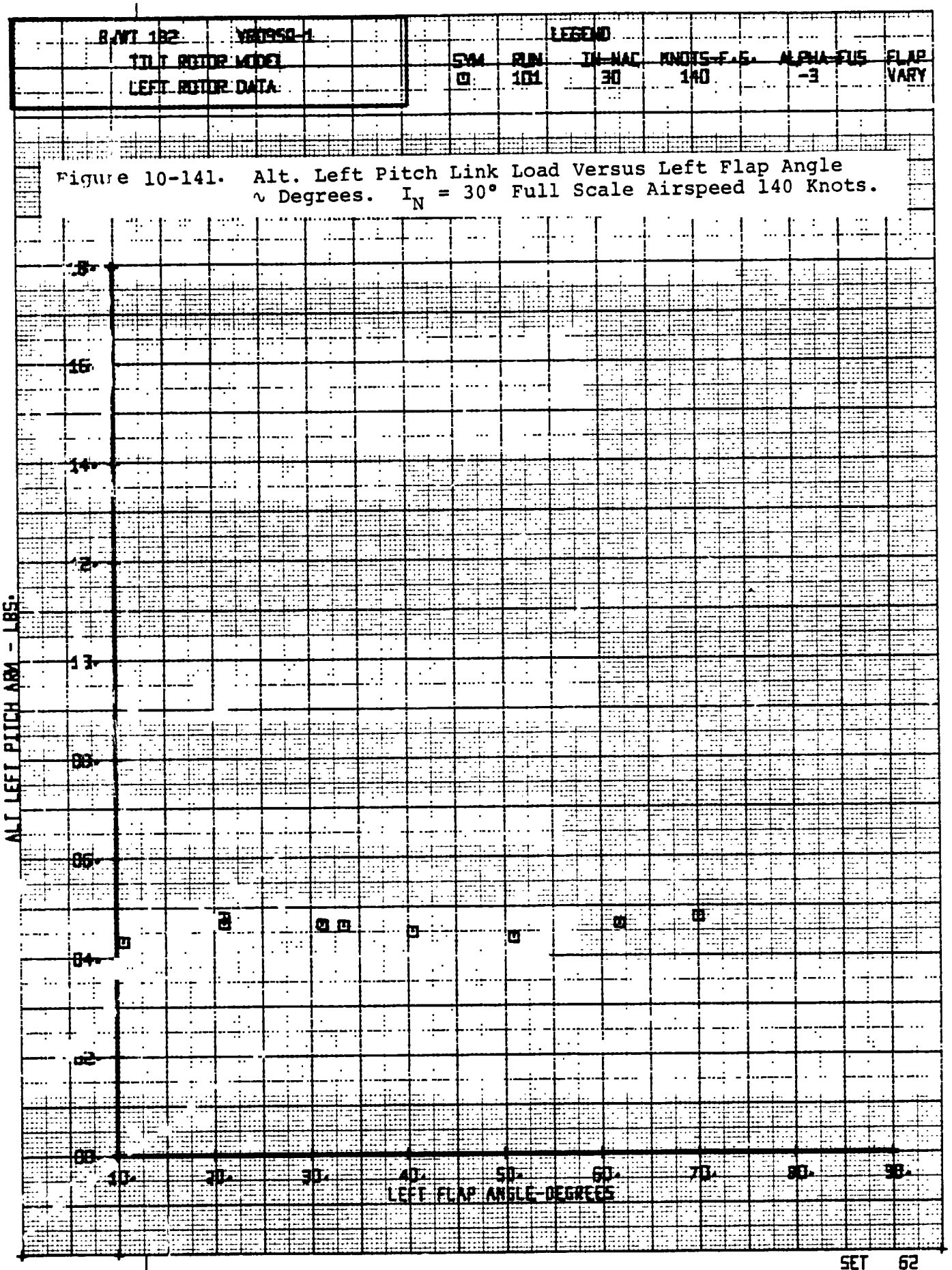


Figure 10-141. Alt. Left Pitch Link Load Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

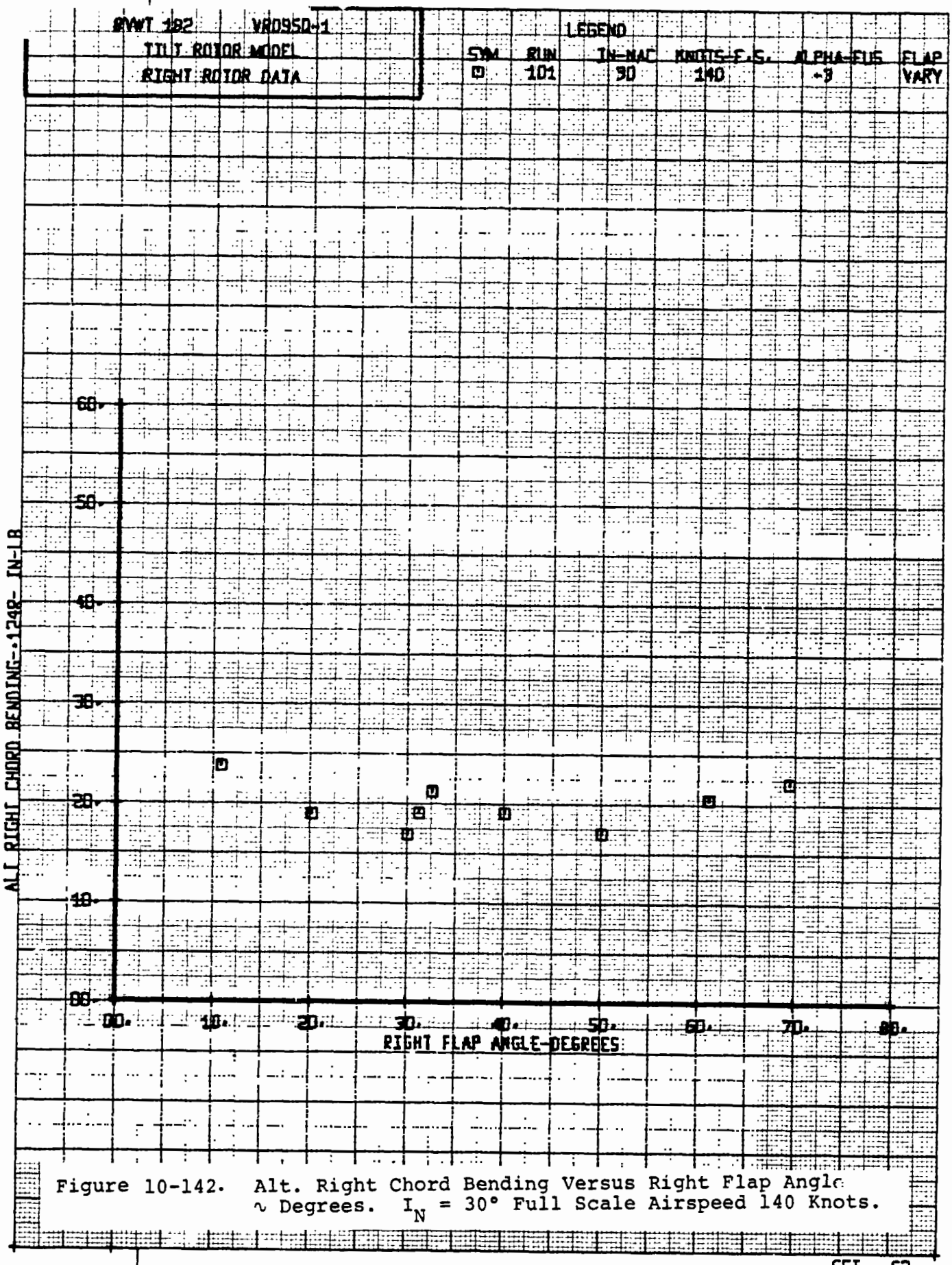


Figure 10-142. Alt. Right Chord Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

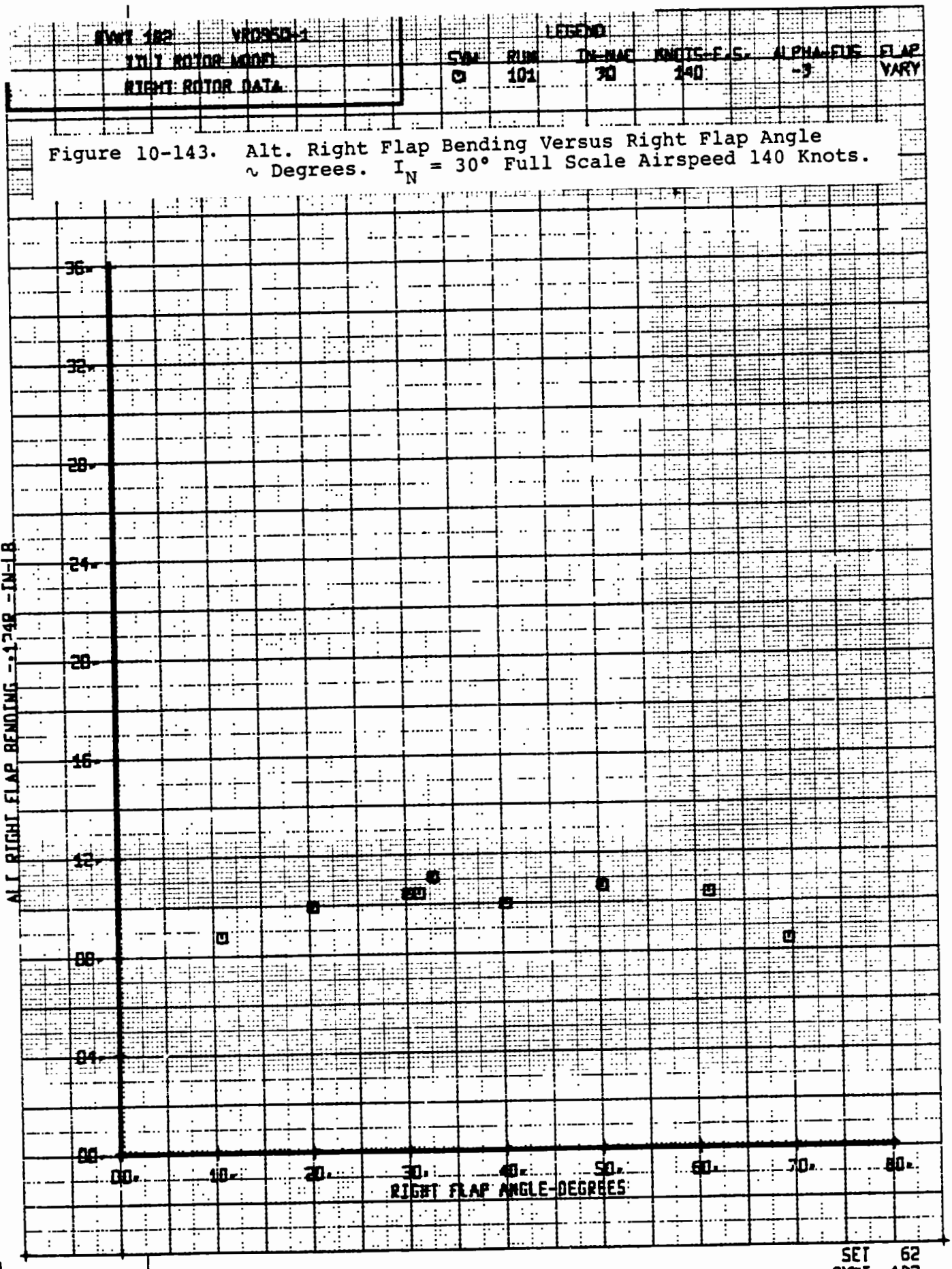


Figure 10-143. Alt. Right Flap Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

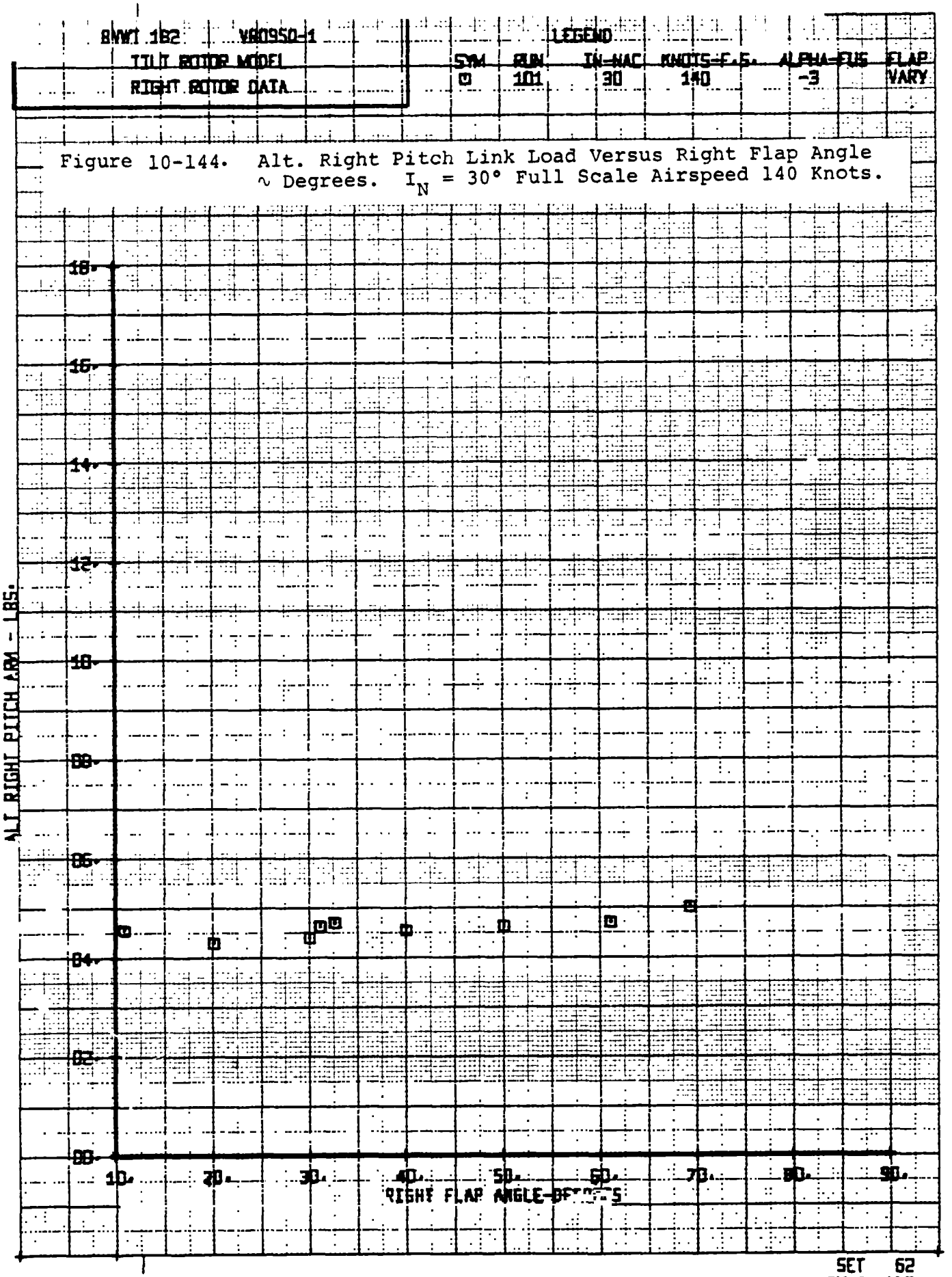


Figure 10-144. Alt. Right Pitch Link Load Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 140 Knots.

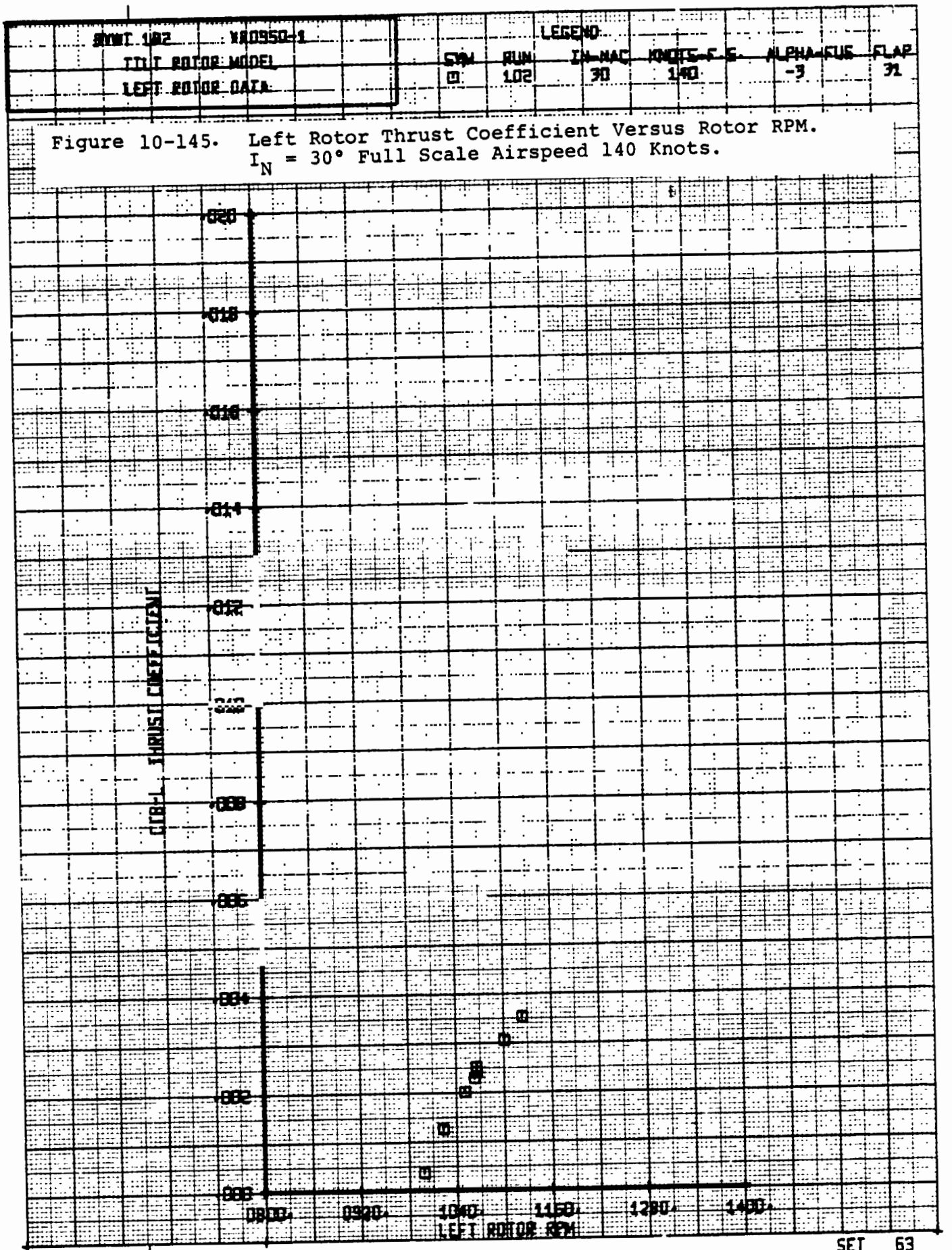


Figure 10-145. Left Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

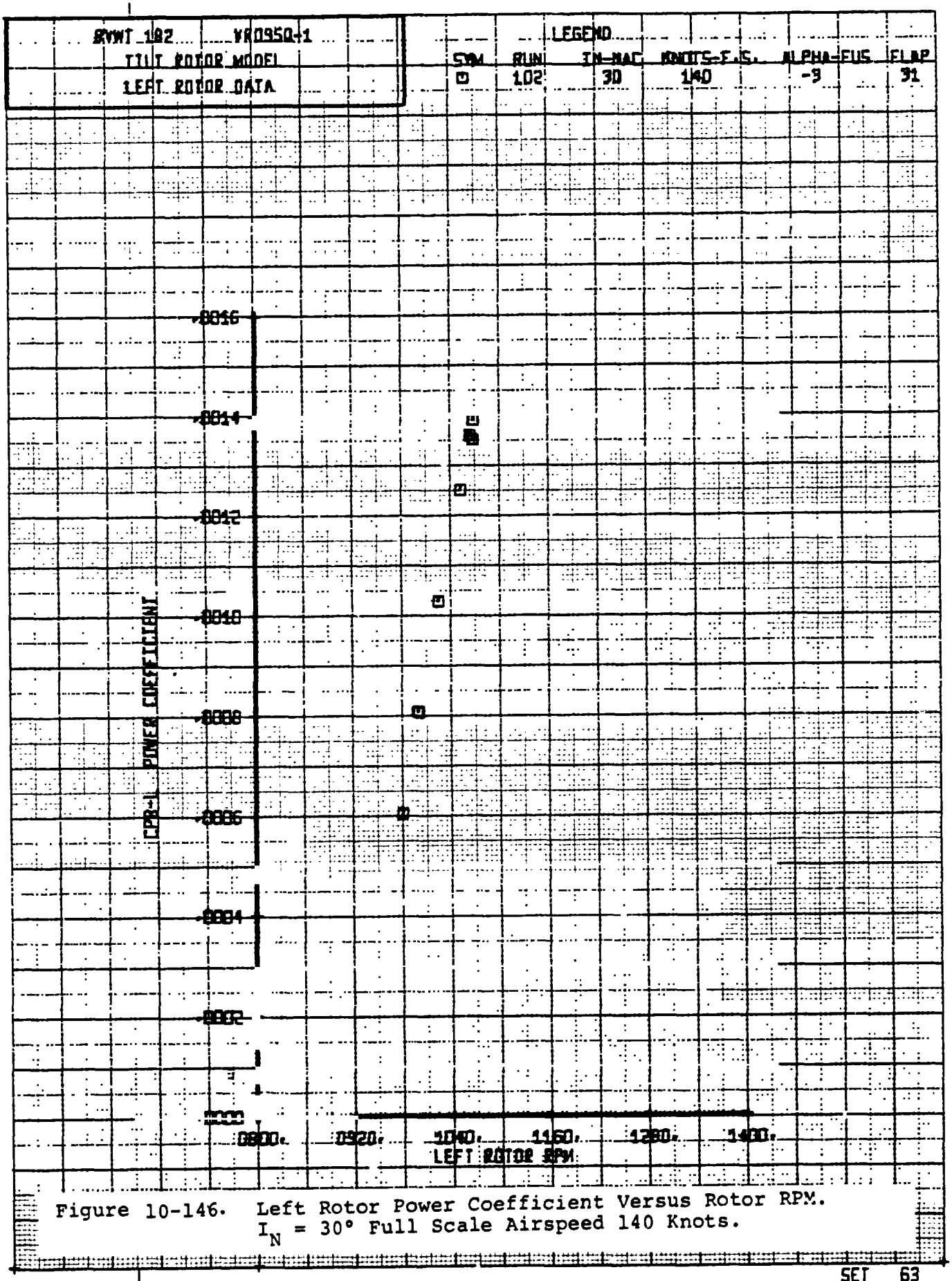


Figure 10-146. Left Rotor Power Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

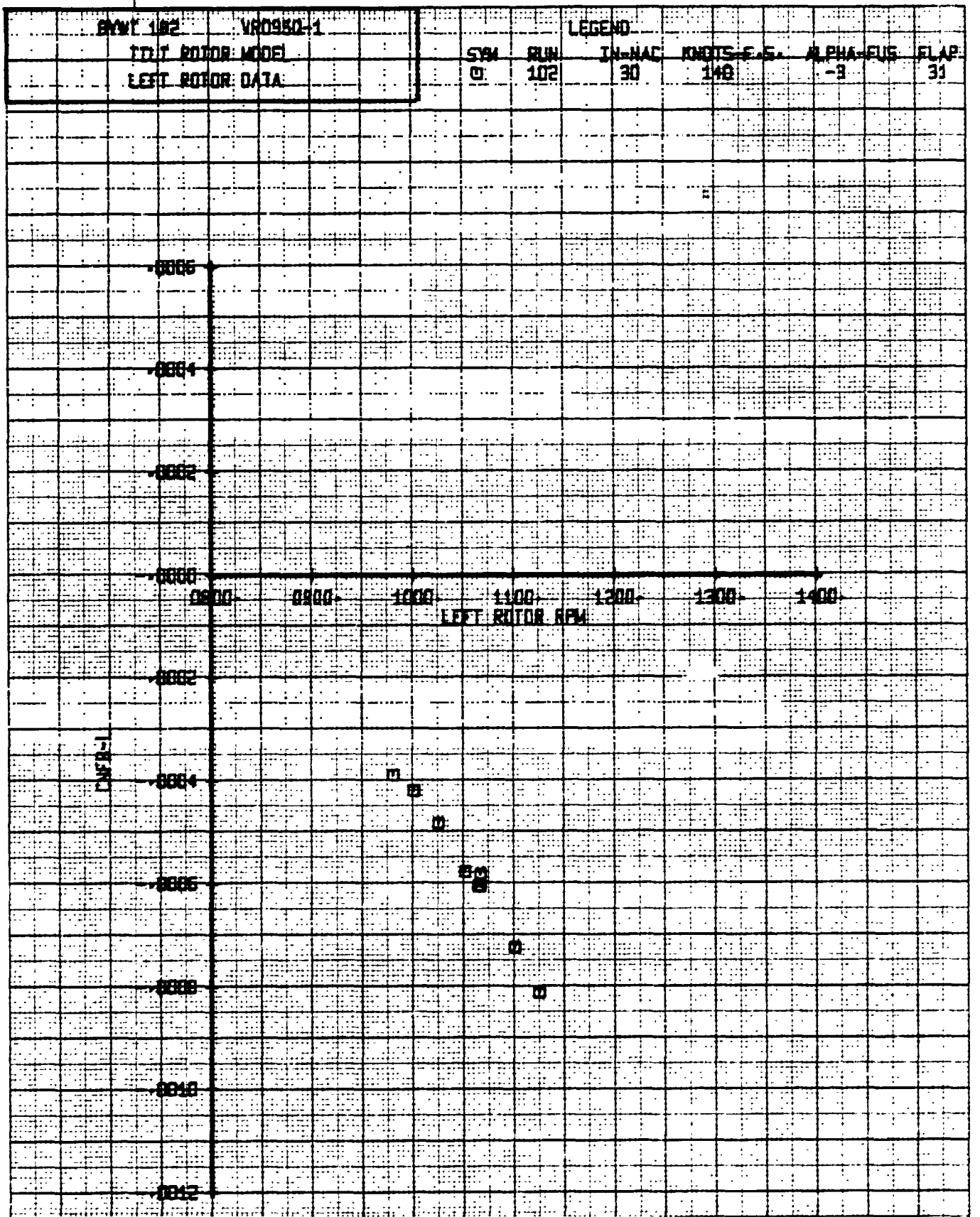


Figure 10-147. Left Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

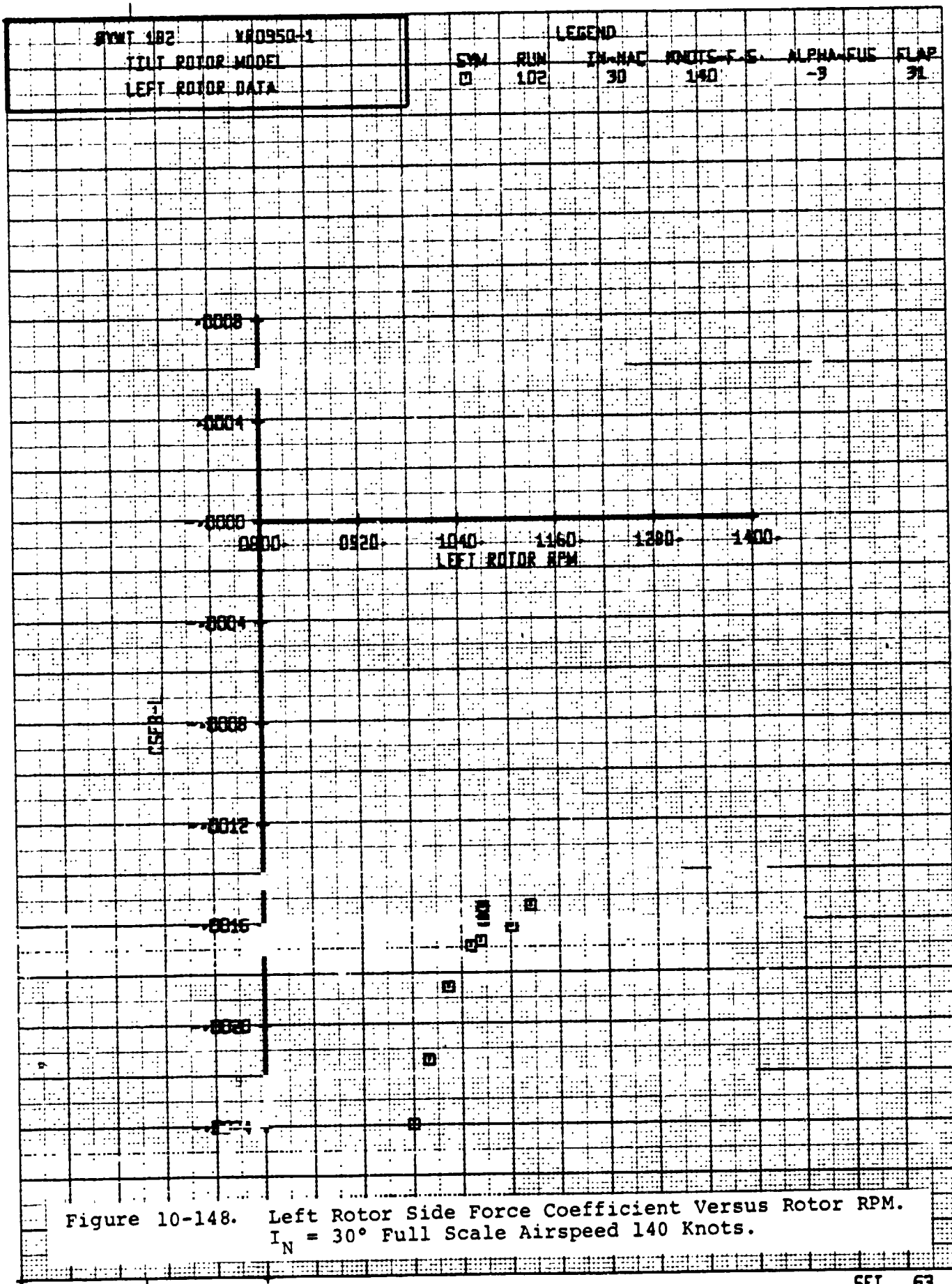


Figure 10-148. Left Rotor Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

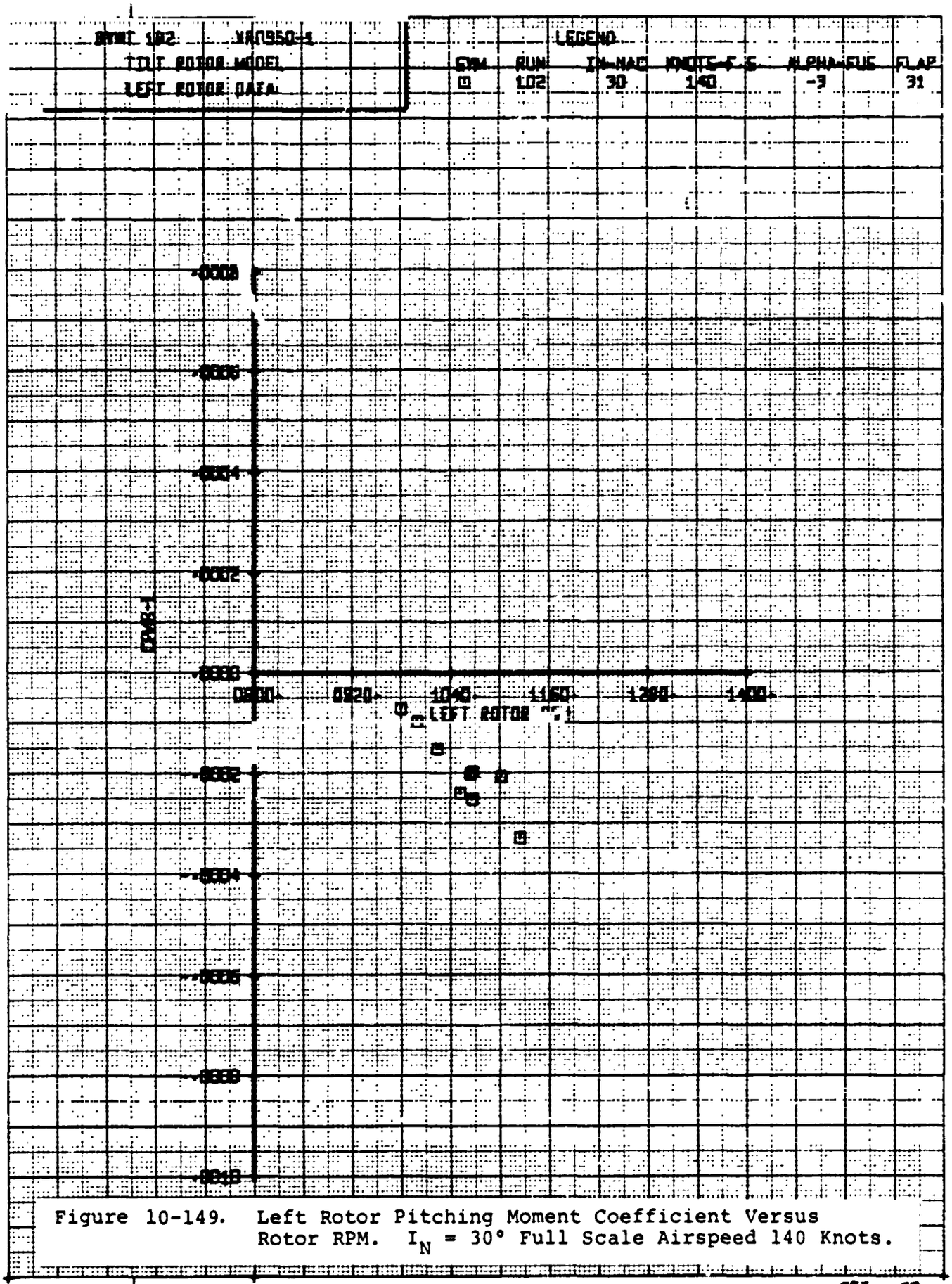


Figure 10-149. Left Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

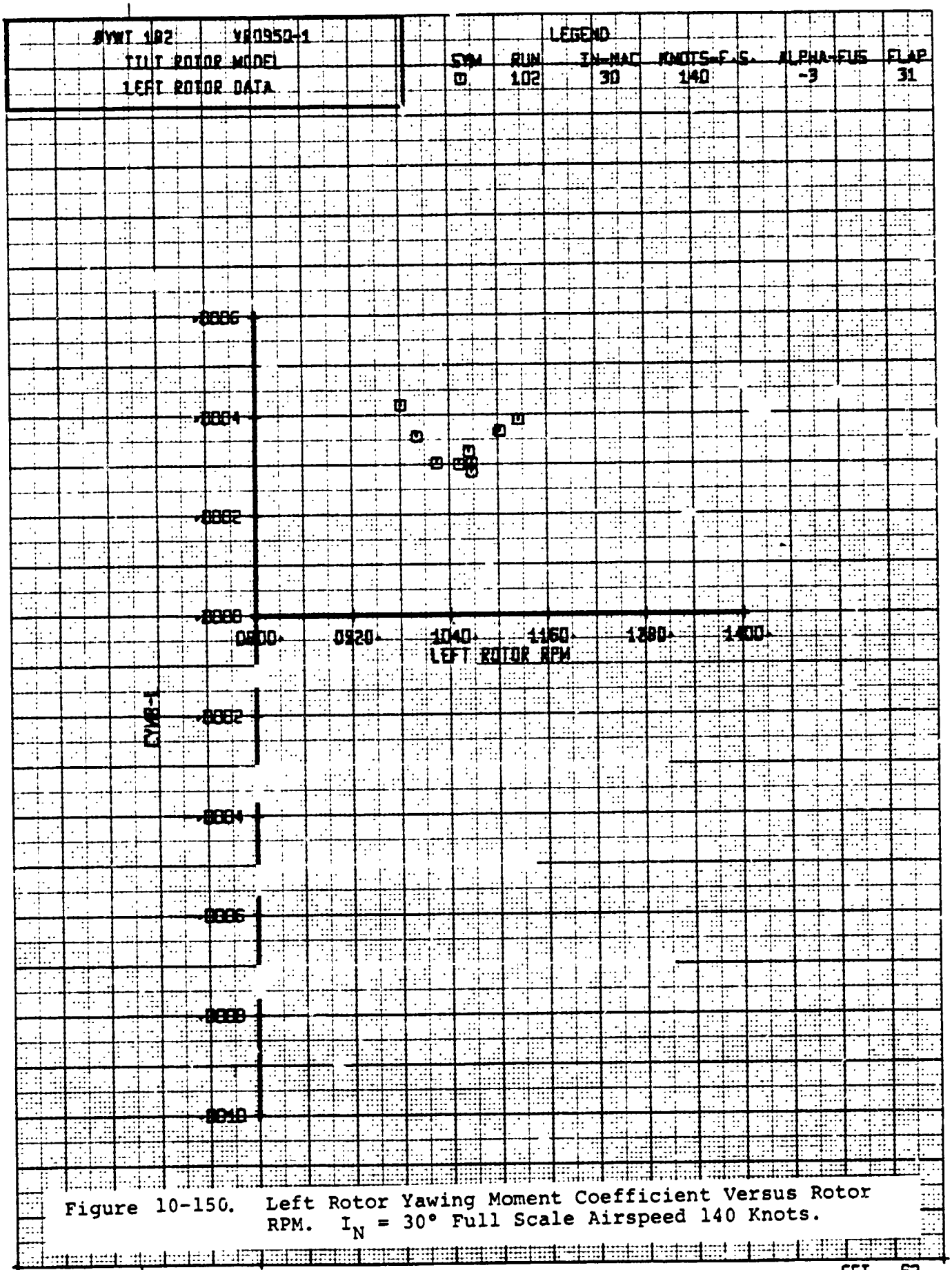


Figure 10-150. Left Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

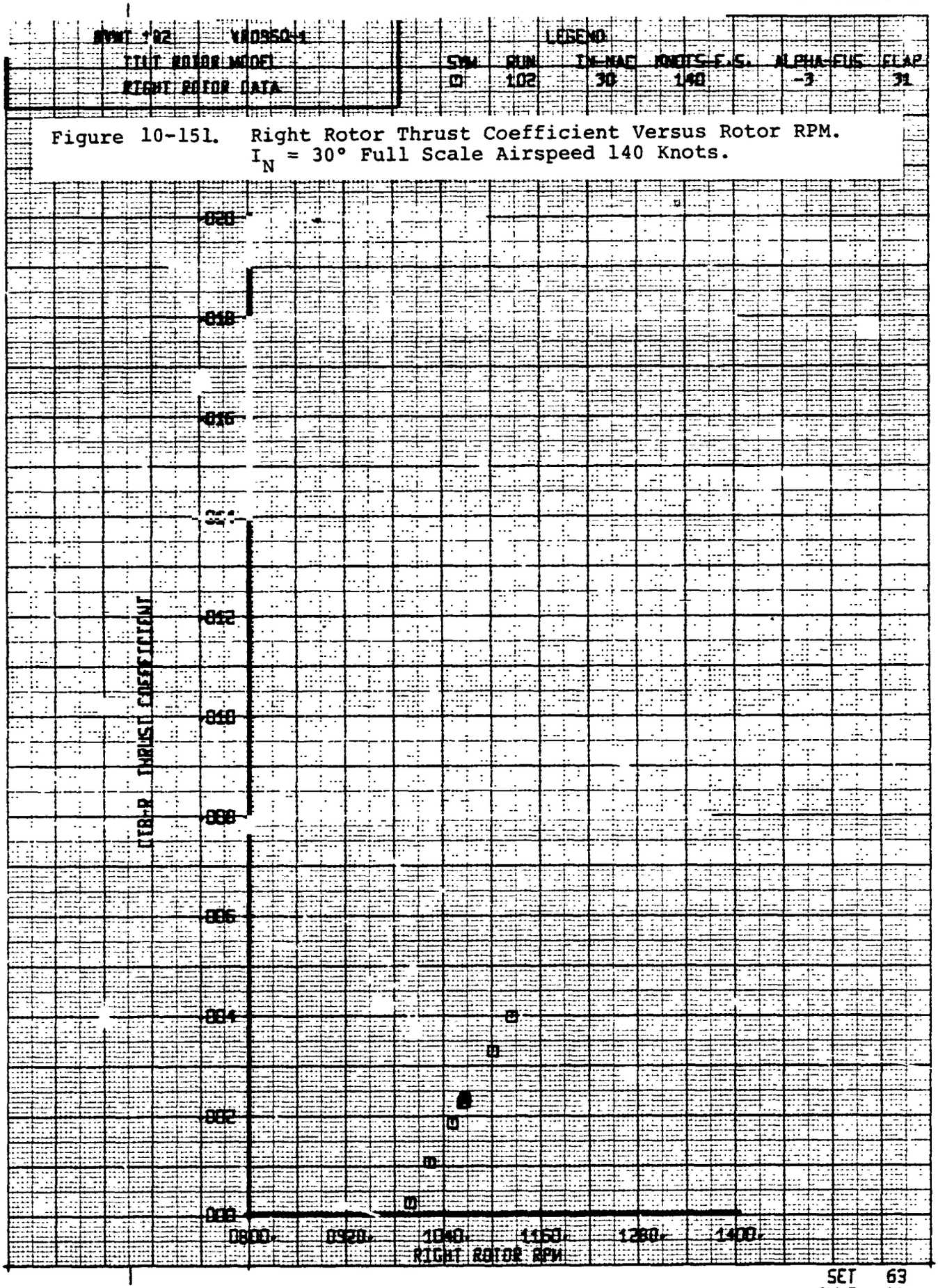


Figure 10-151. Right Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

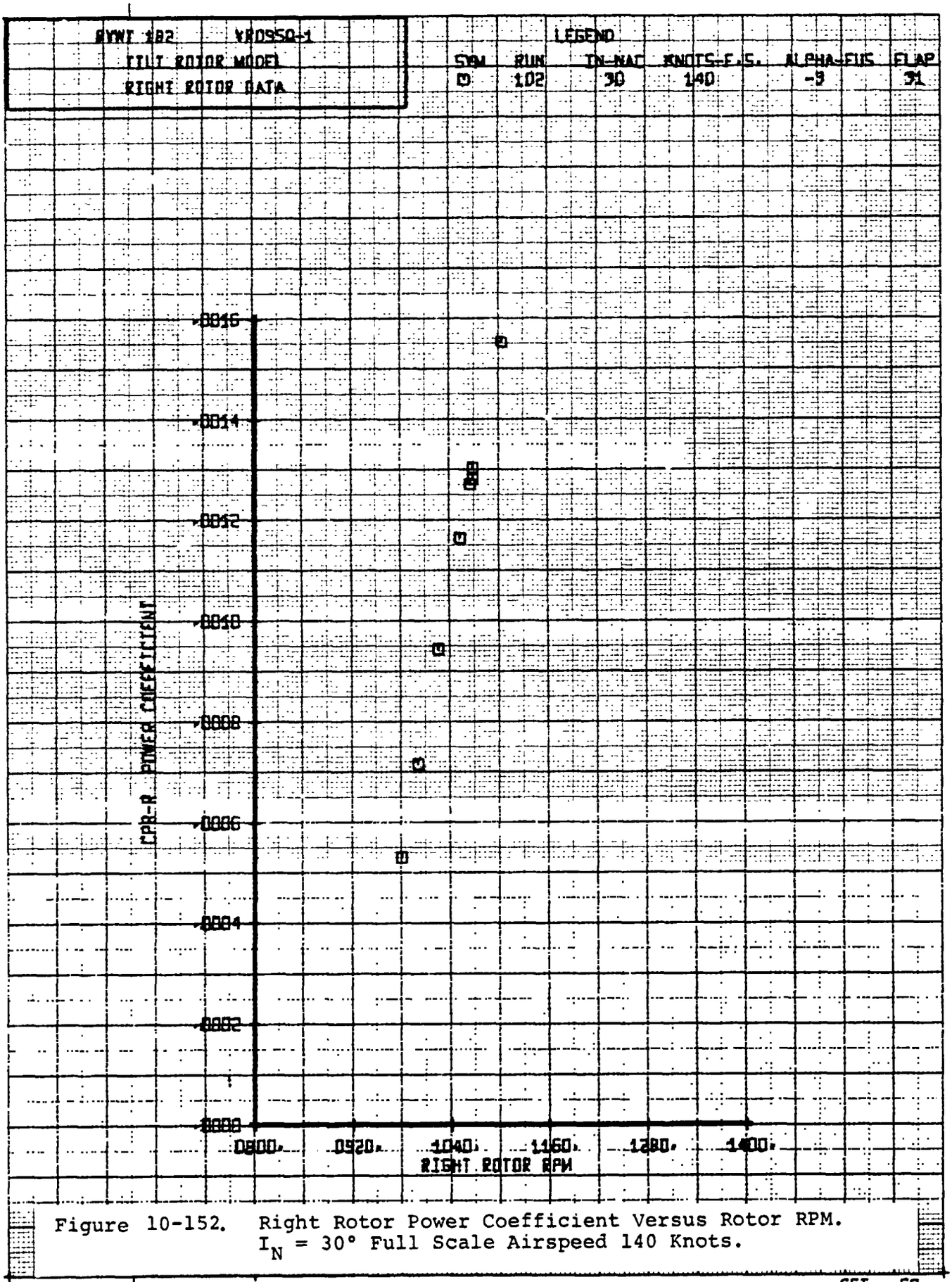


Figure 10-152. Right Rotor Power Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

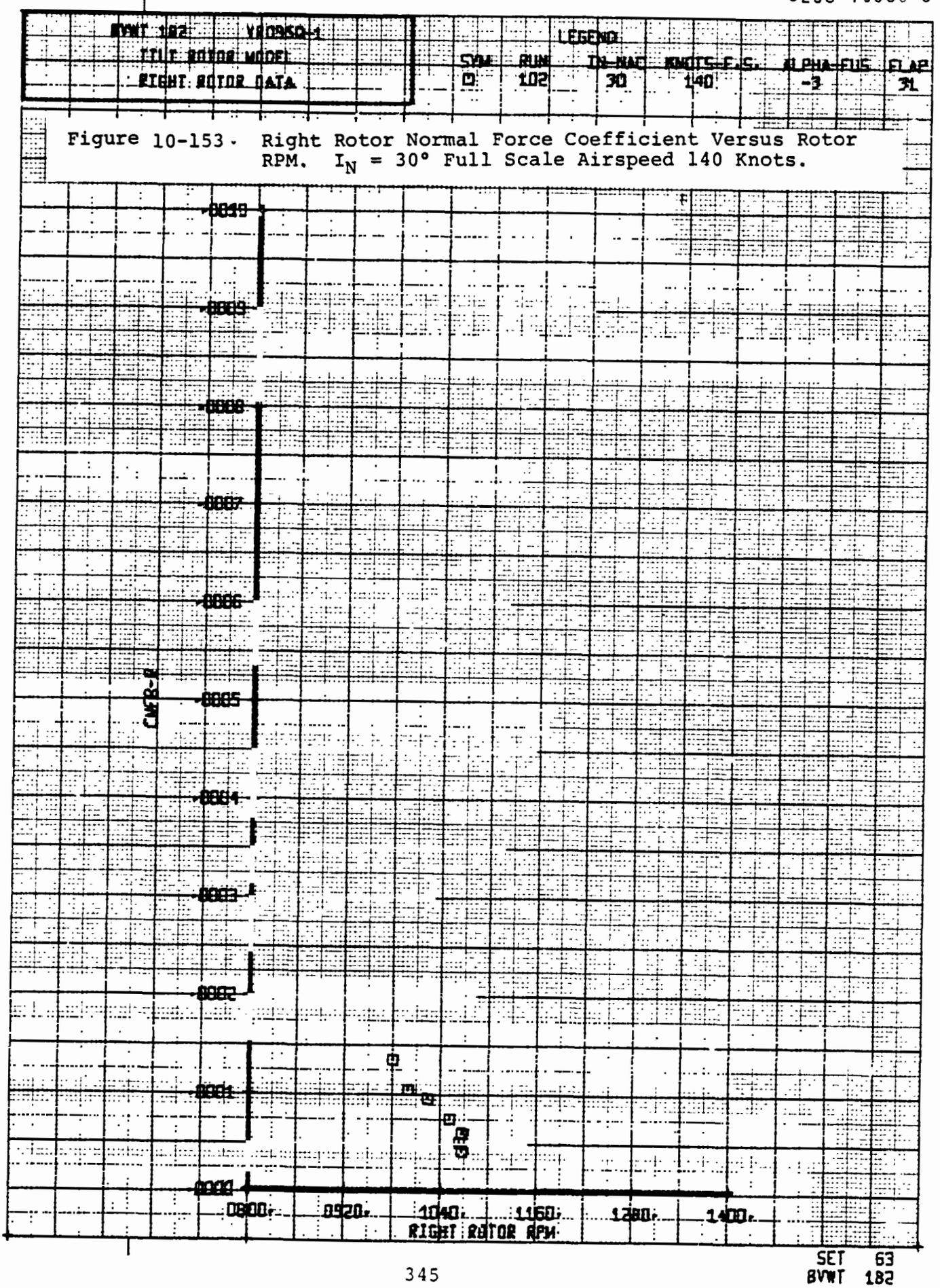


Figure 10-153. Right Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

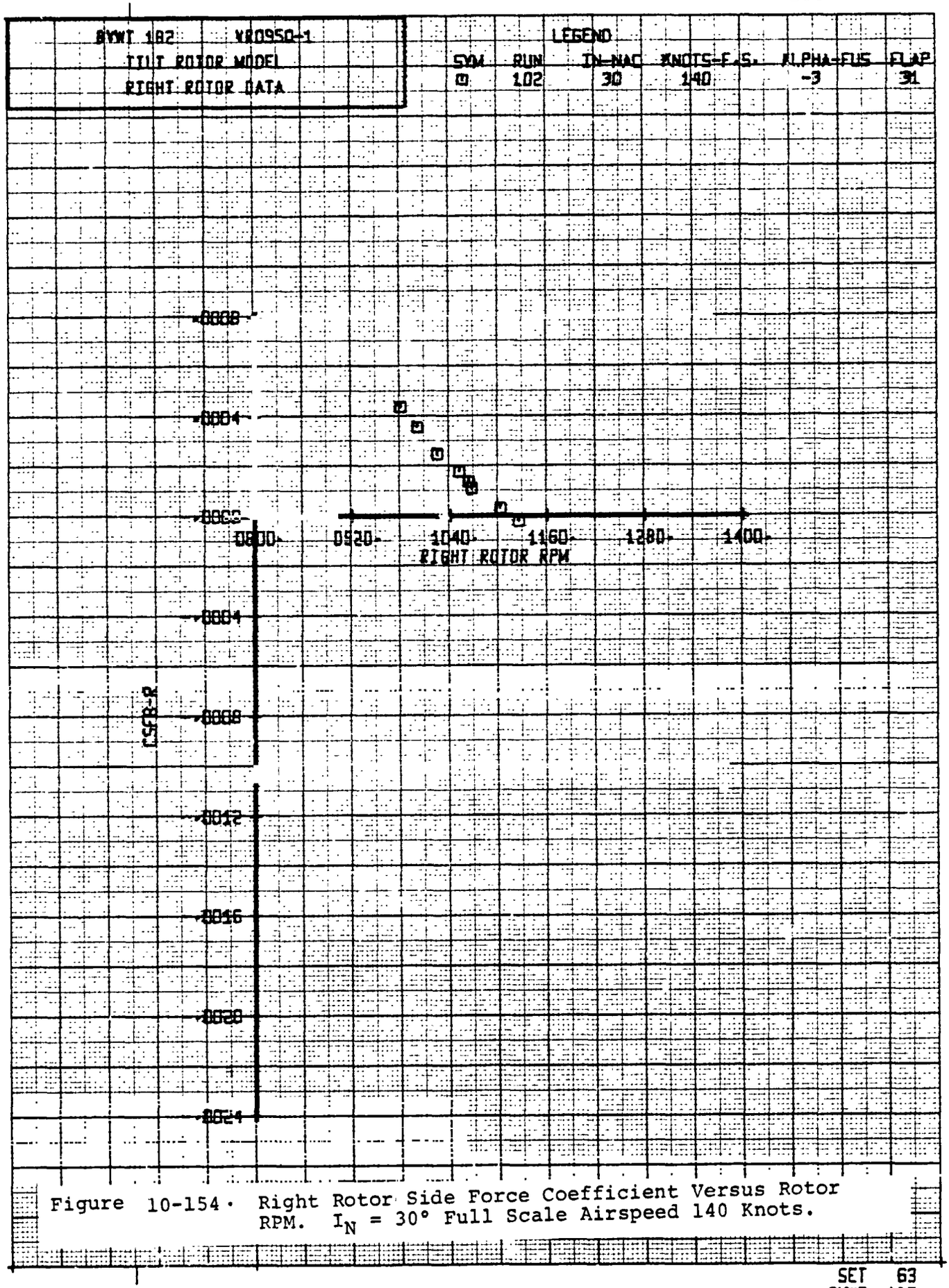


Figure 10-154. Right Rotor Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

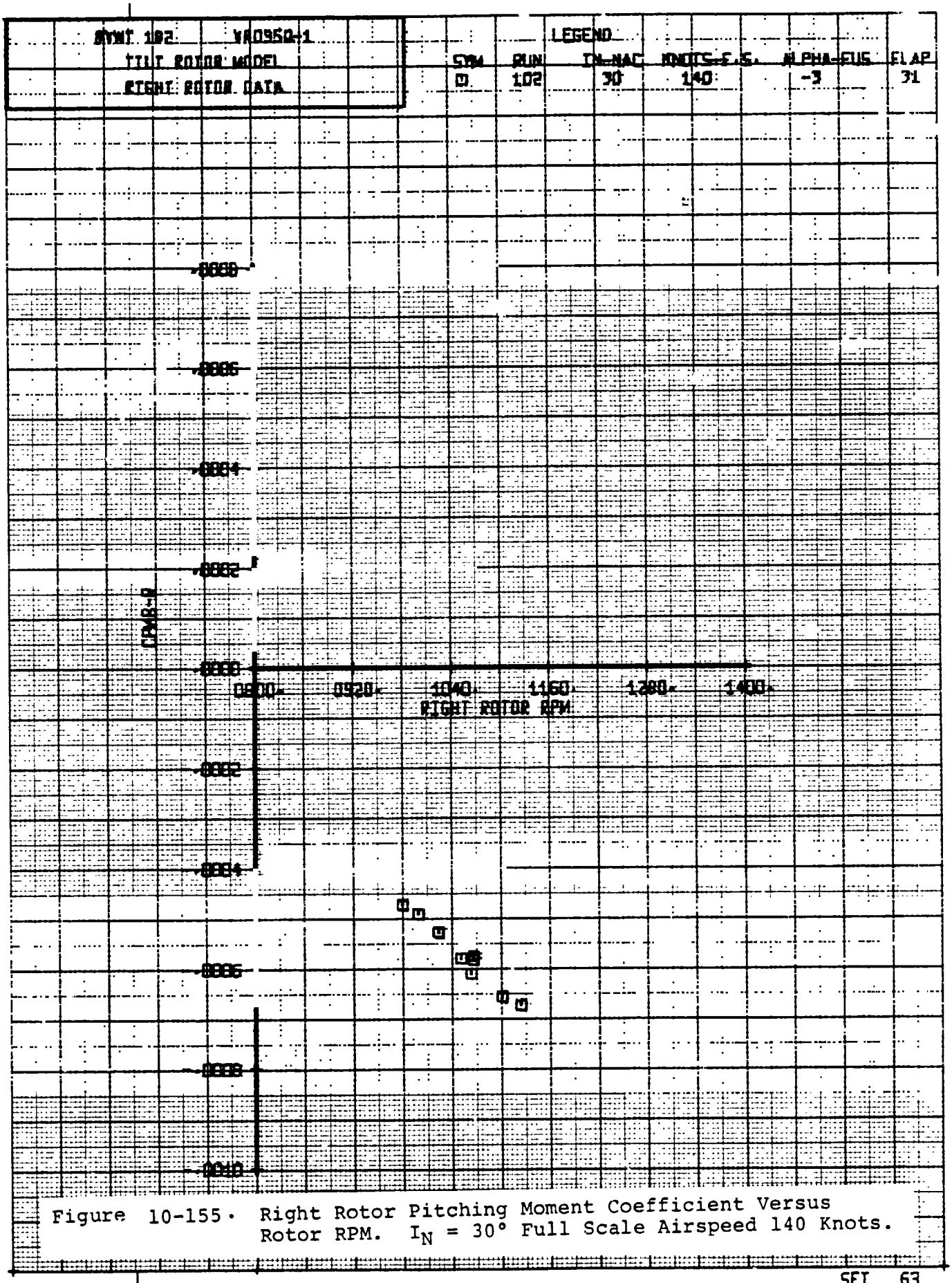


Figure 10-155. Right Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

SET 63
BVWT 182

SET 63
BVWT 182

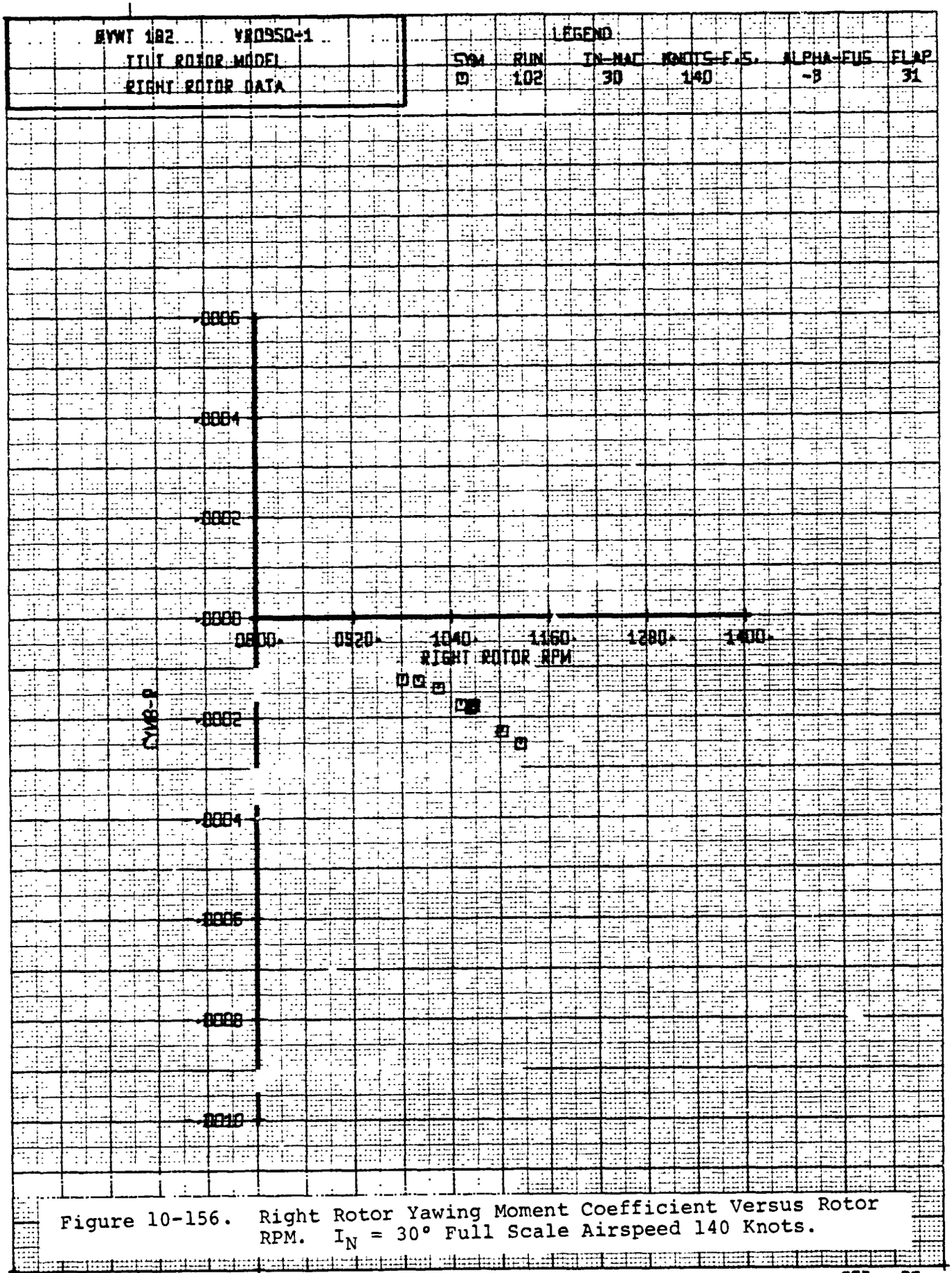


Figure 10-156. Right Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

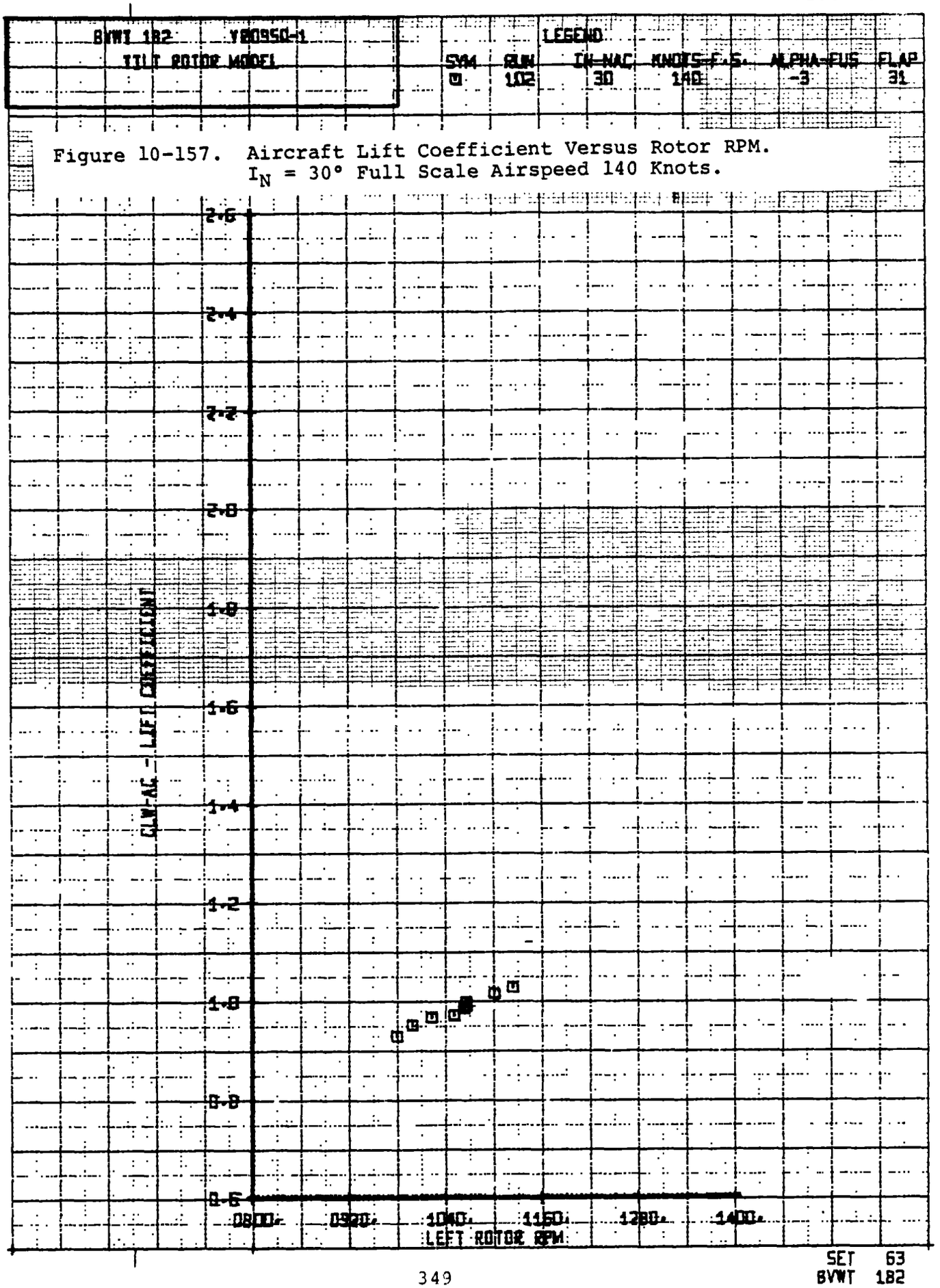


Figure 10-157. Aircraft Lift Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

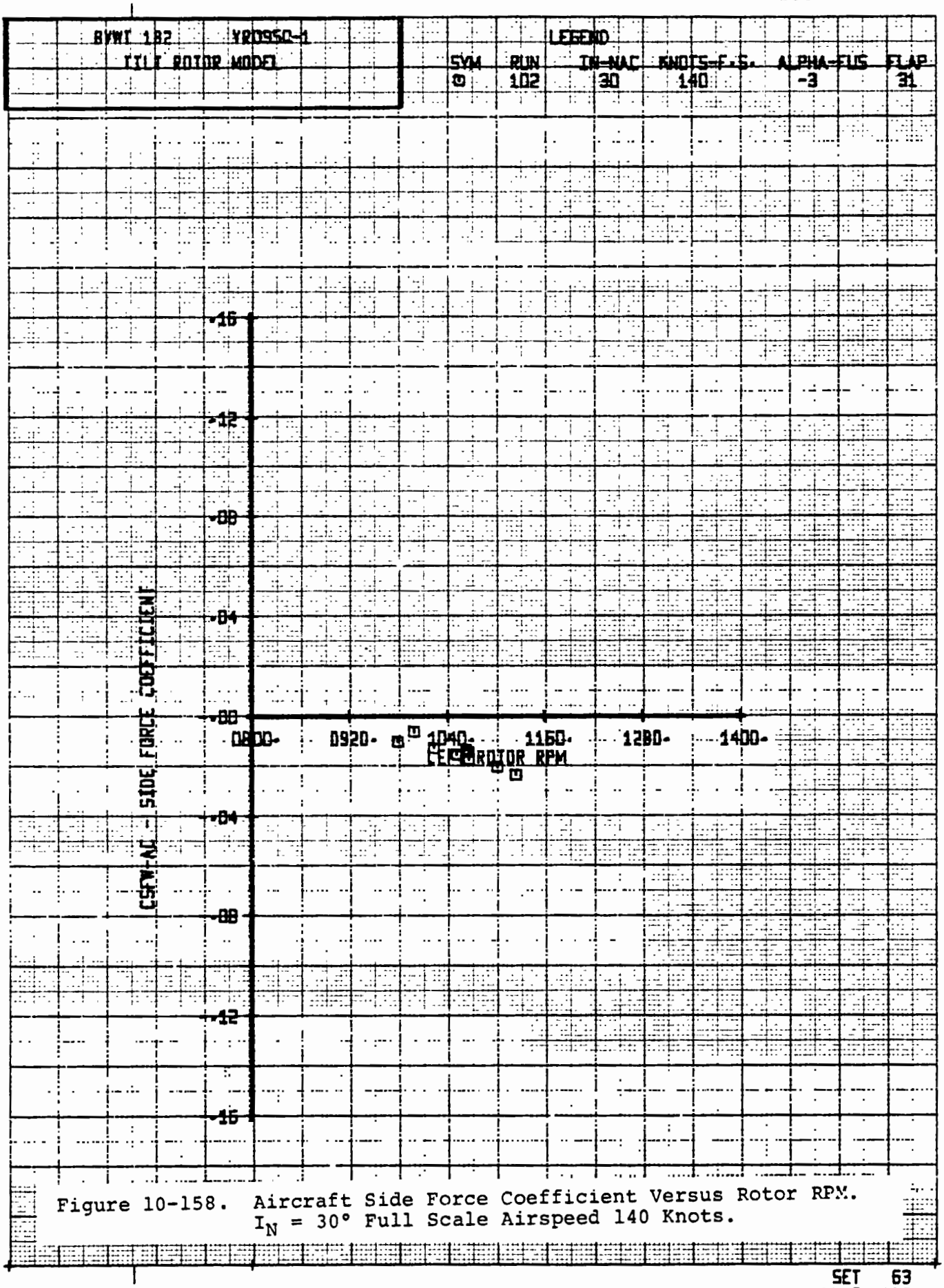


Figure 10-158. Aircraft Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

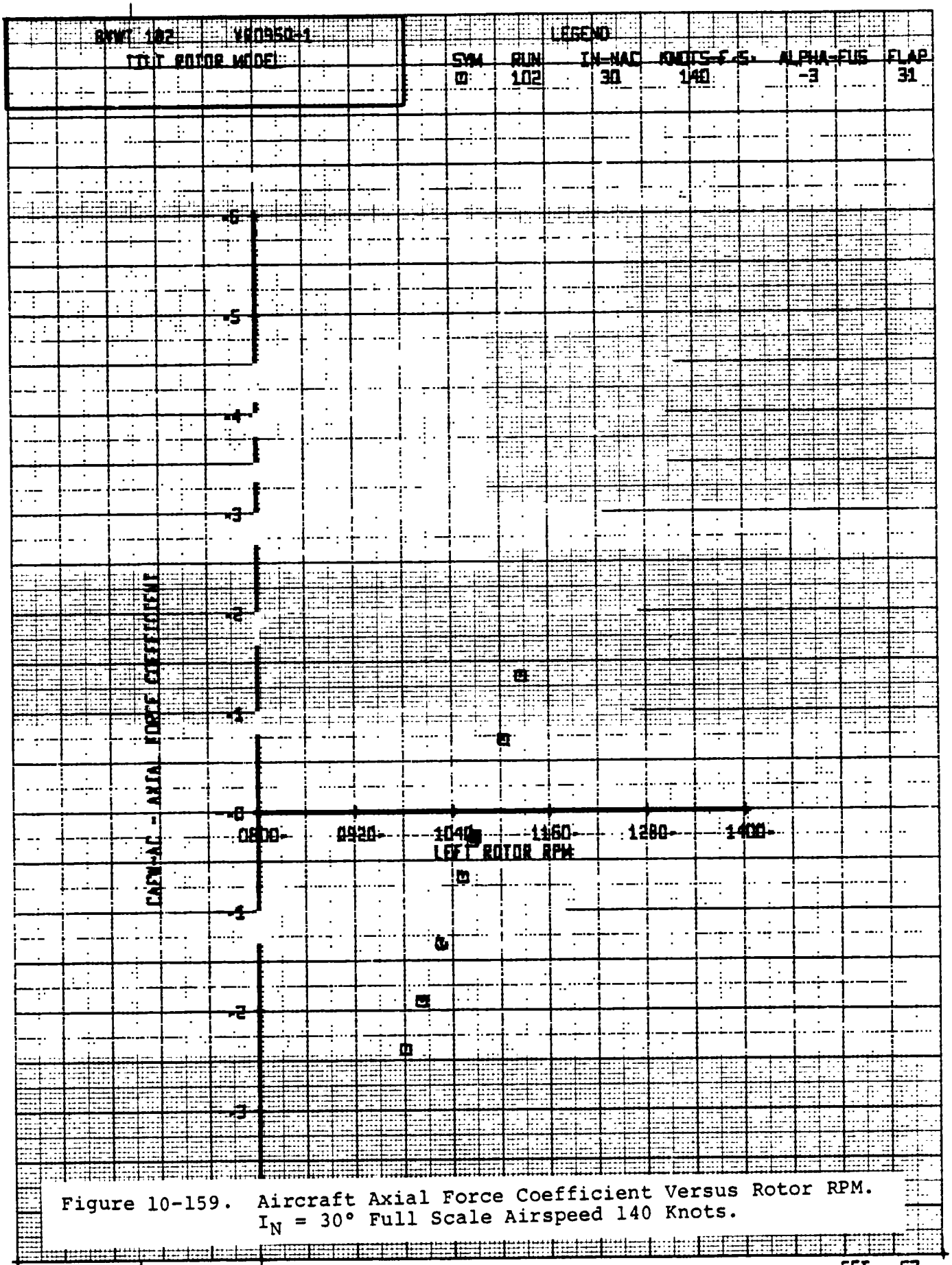


Figure 10-159. Aircraft Axial Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

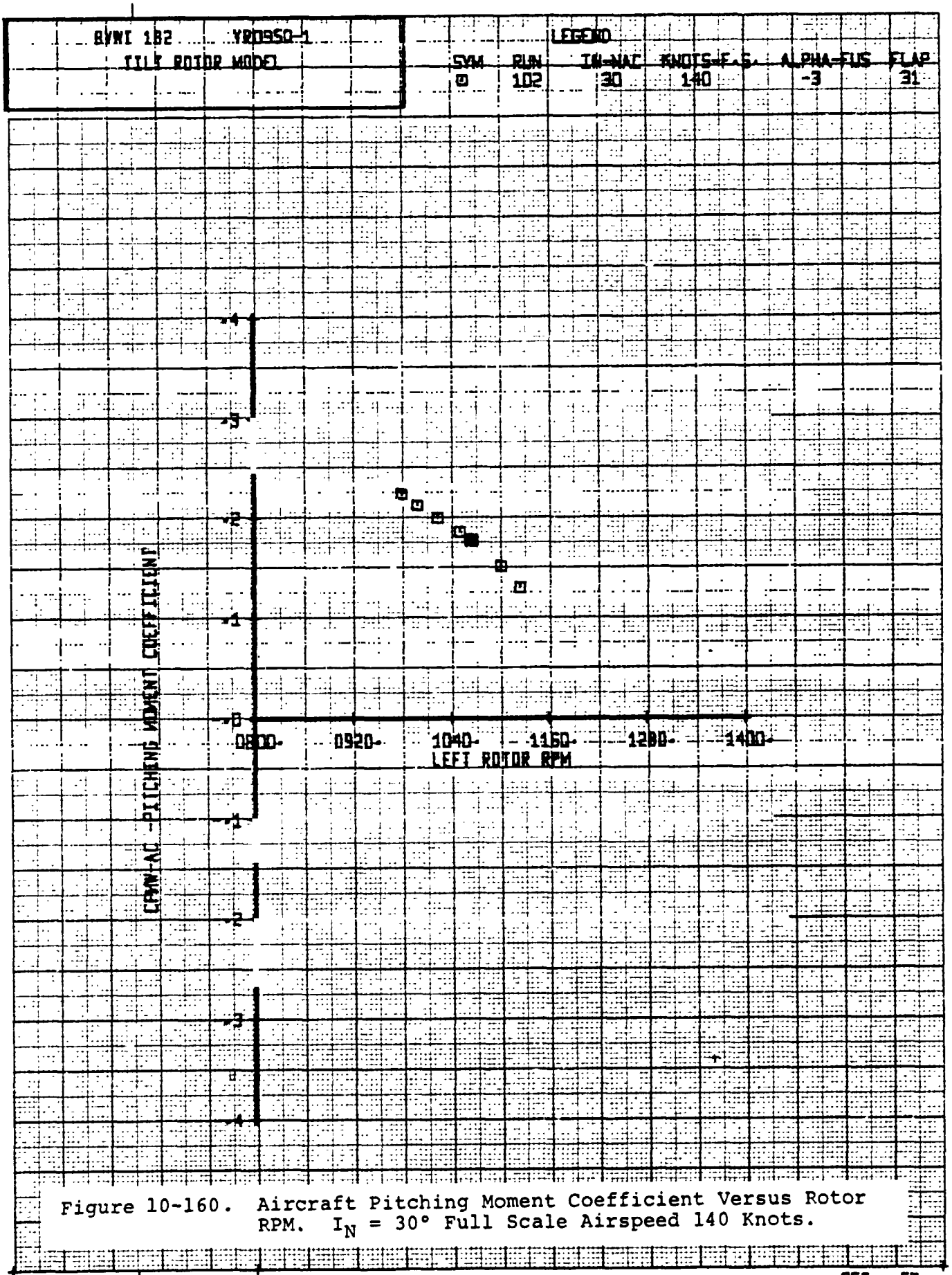


Figure 10-160. Aircraft Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

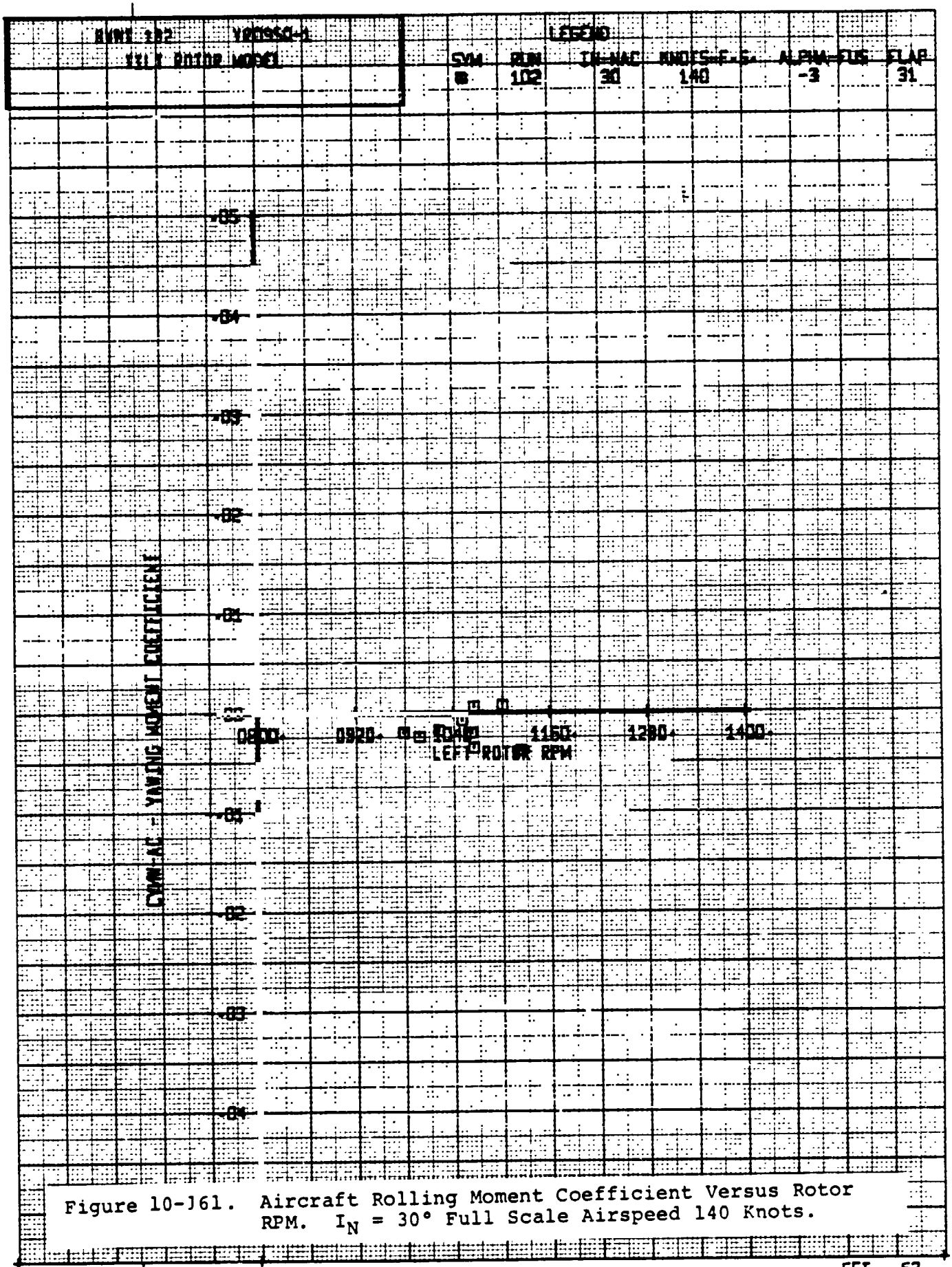


Figure 10-J61. Aircraft Rolling Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

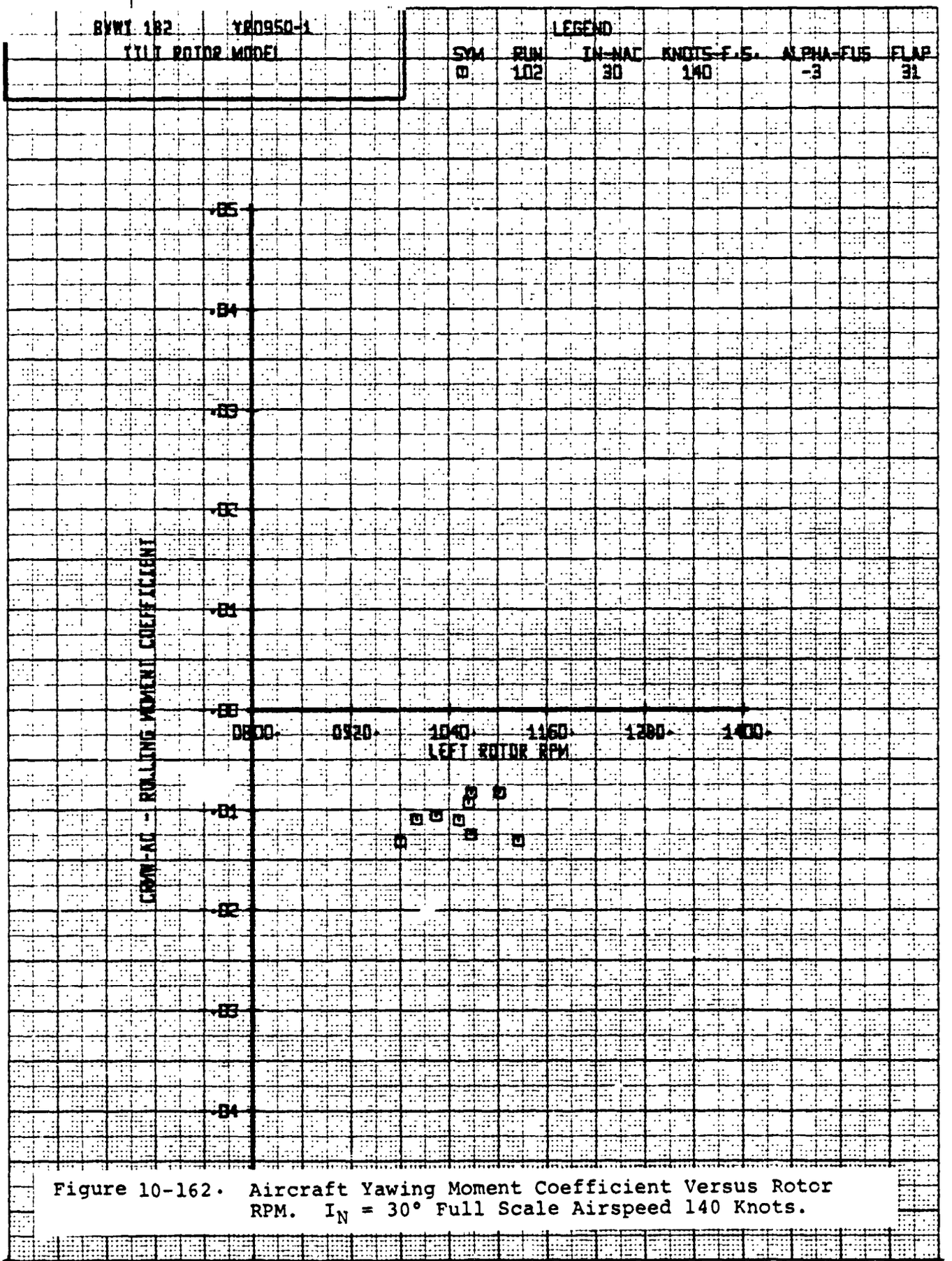


Figure 10-162. Aircraft Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

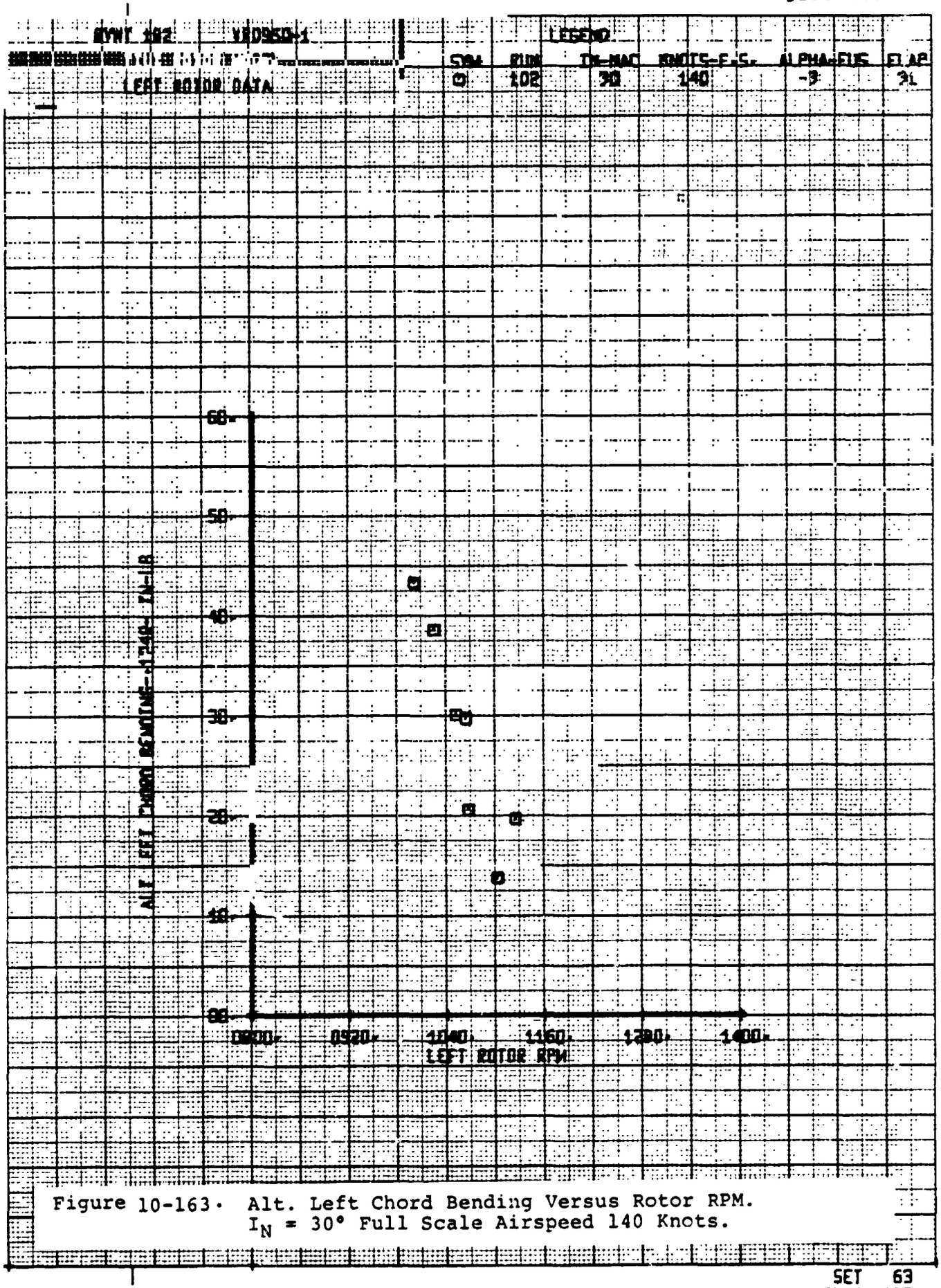
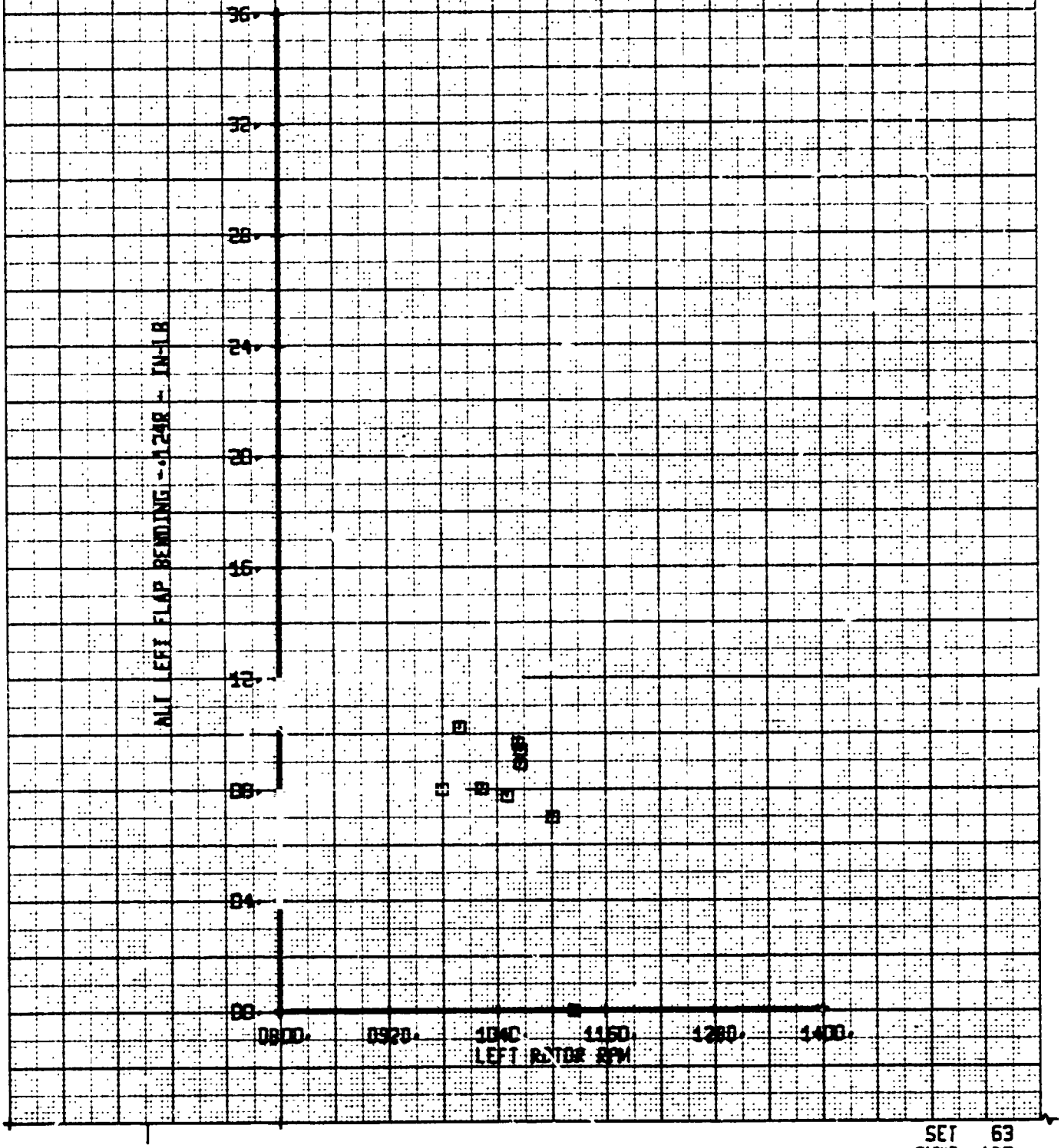


Figure 10-163. Alt. Left Chord Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	102	30	140	-9	31

Figure 10-164. Alt. Left Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.



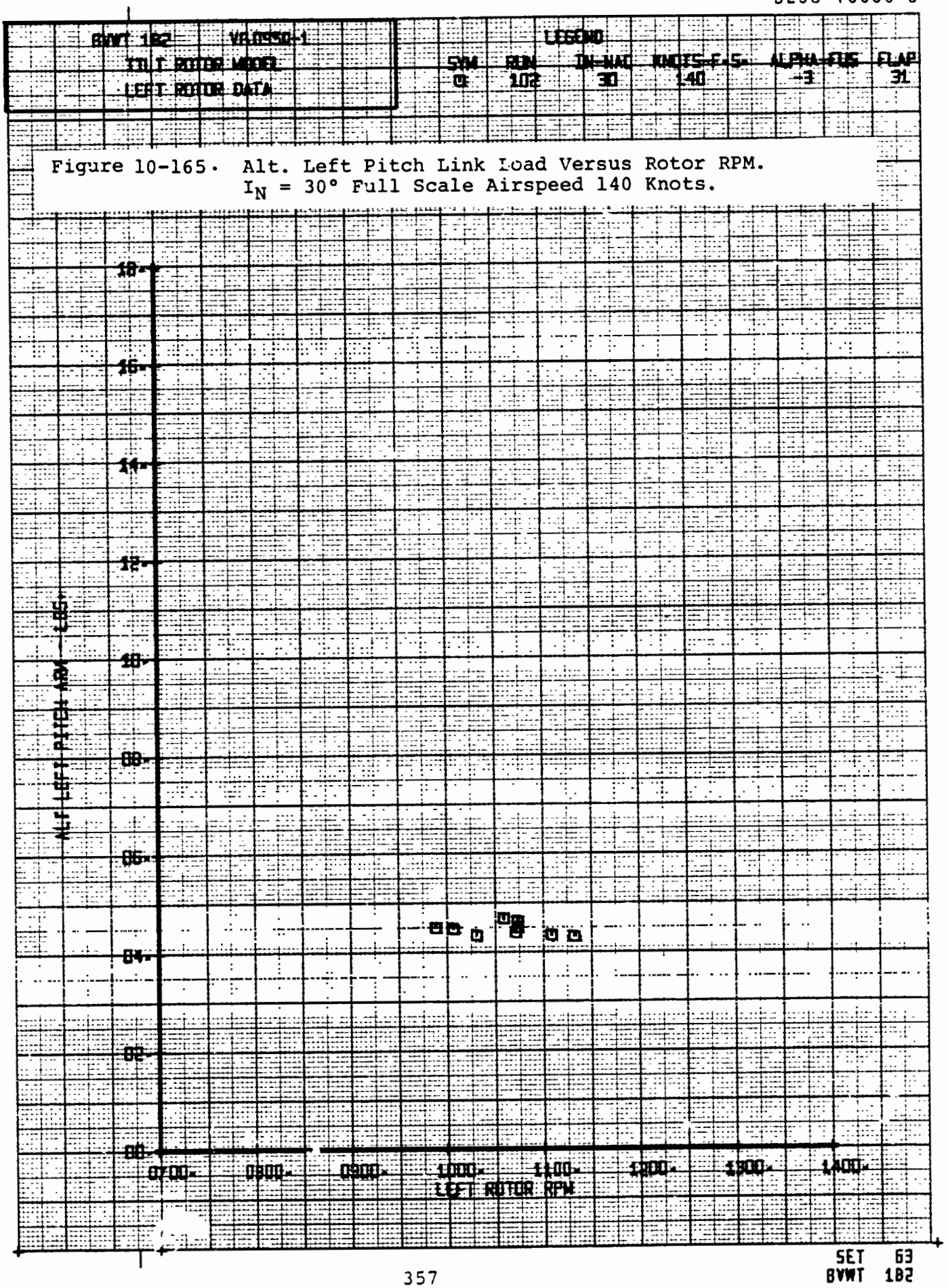


Figure 10-165. Alt. Left Pitch Link Load Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

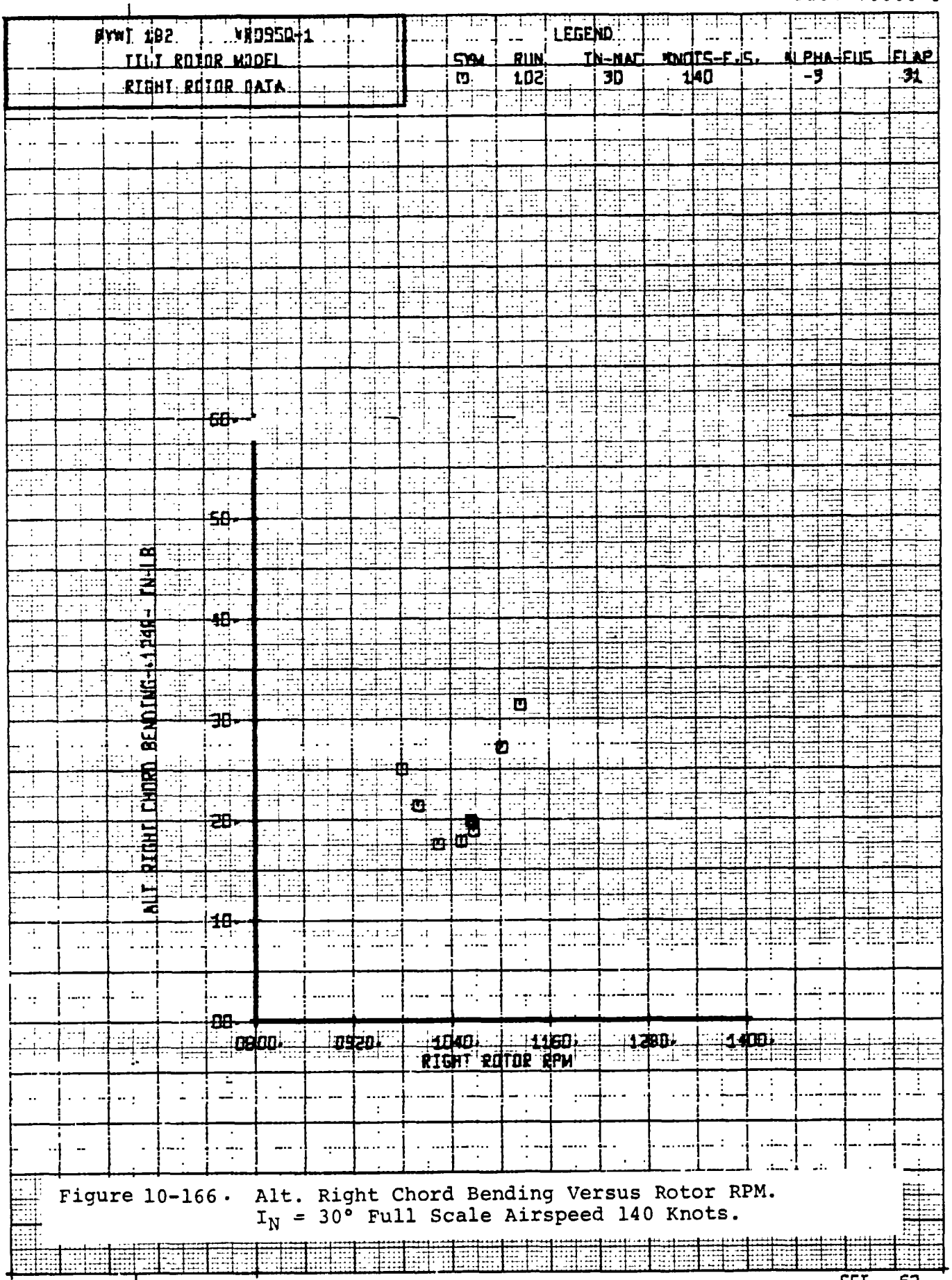


Figure 10-166. Alt. Right Chord Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

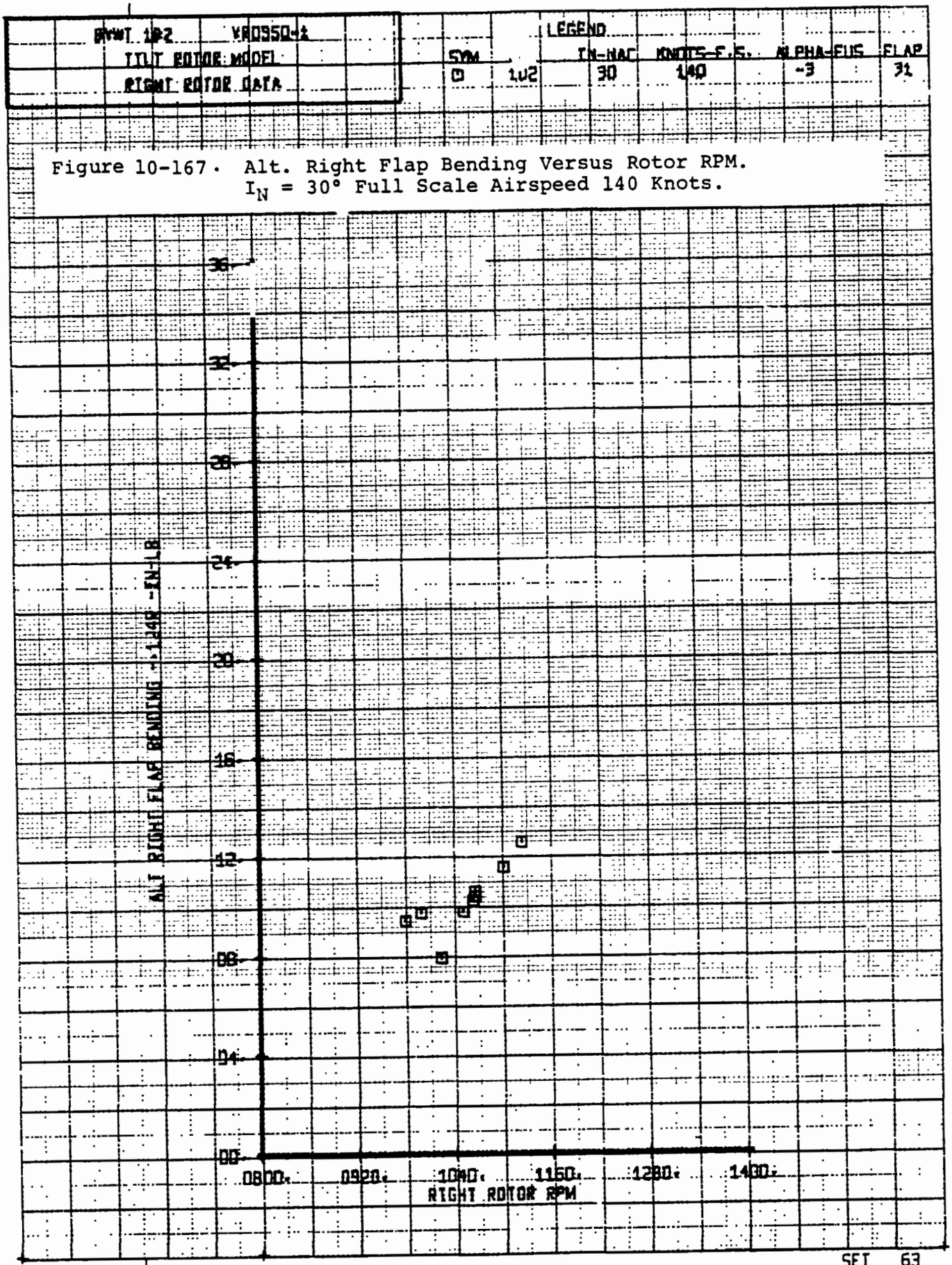


Figure 10-167. Alt. Right Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

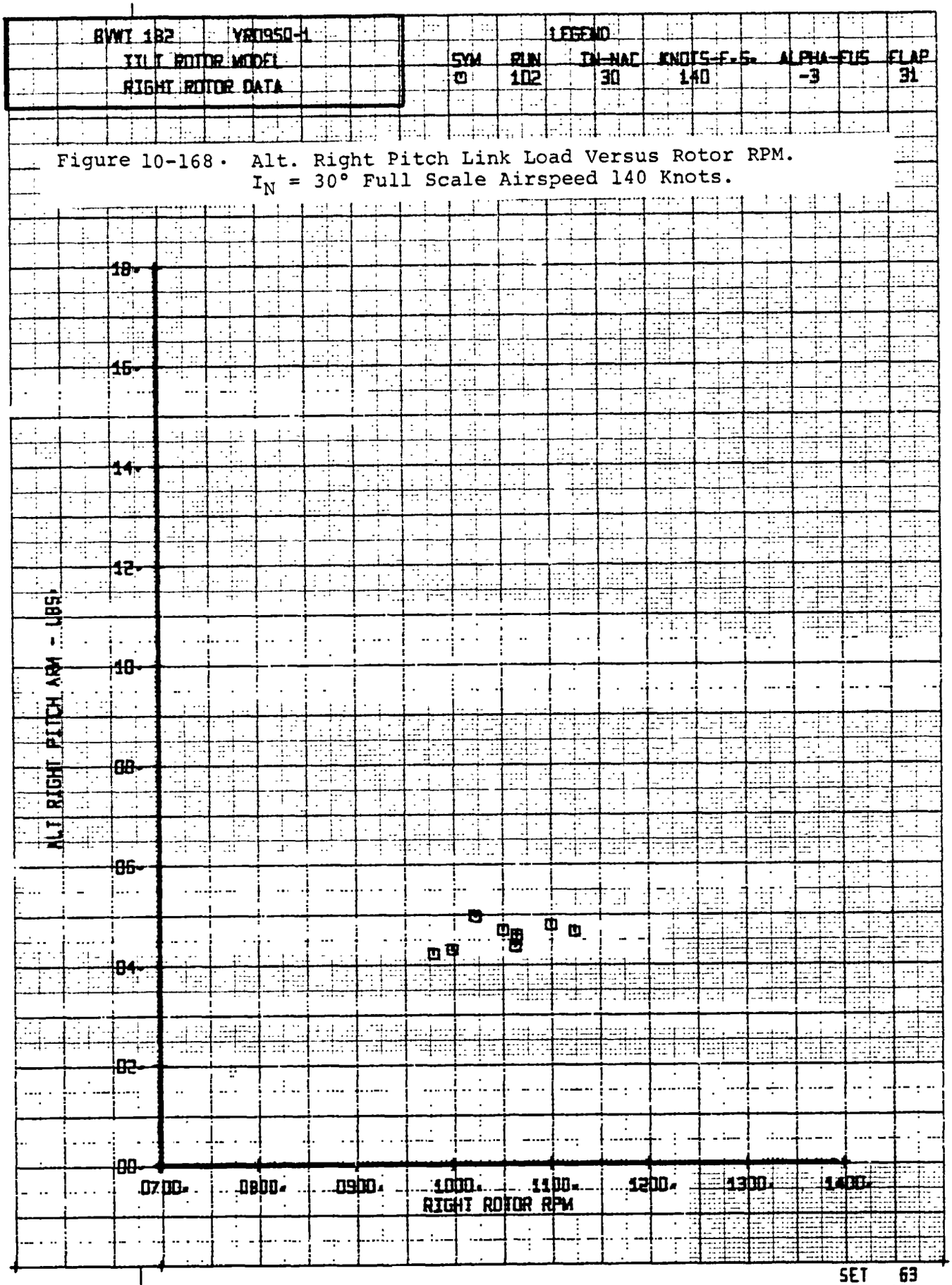


Figure 10-168. Alt. Right Pitch Link Load Versus Rotor RPM. I_N = 30° Full Scale Airspeed 140 Knots.

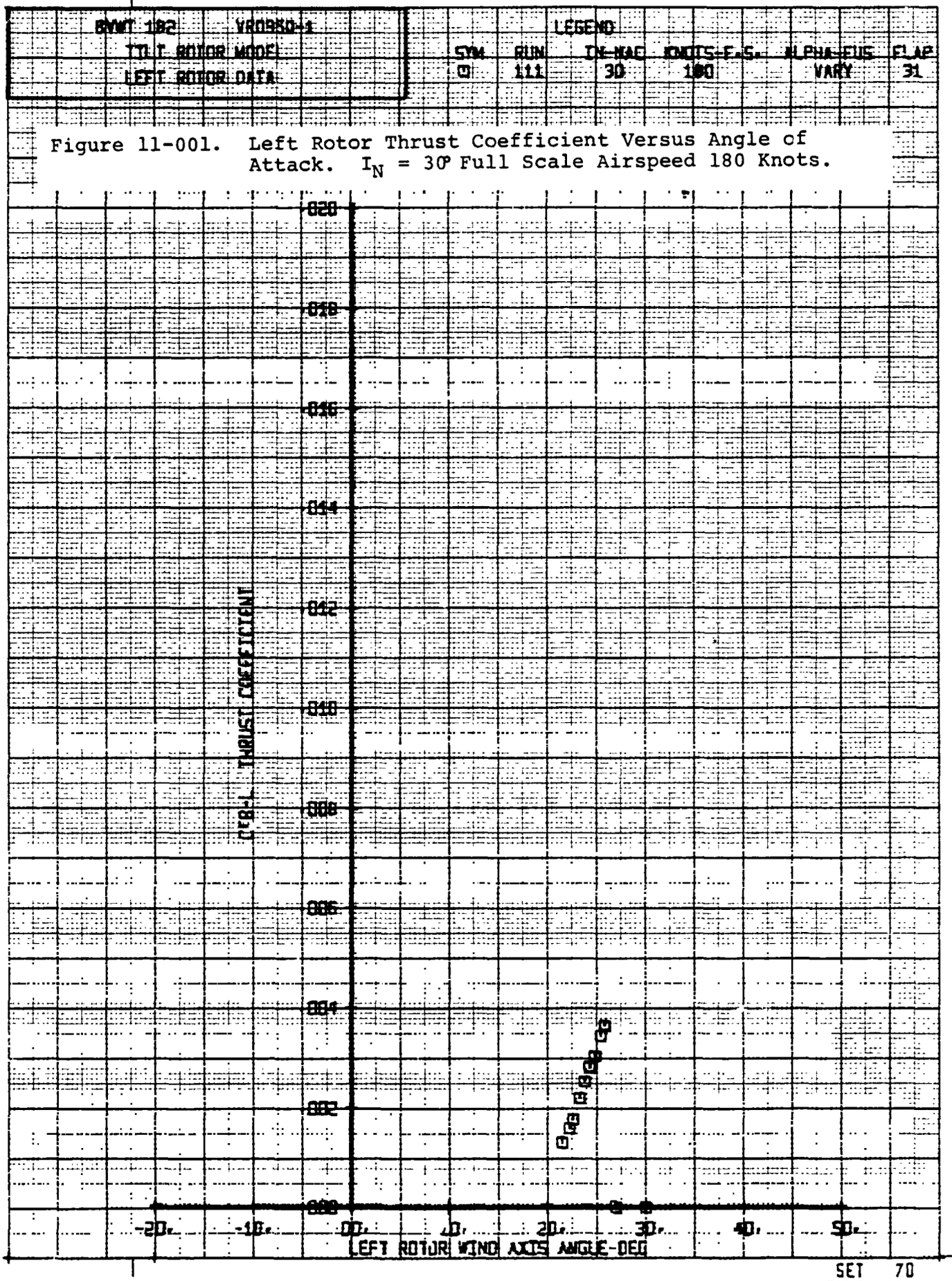


Figure 11-001. Left Rotor Thrust Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

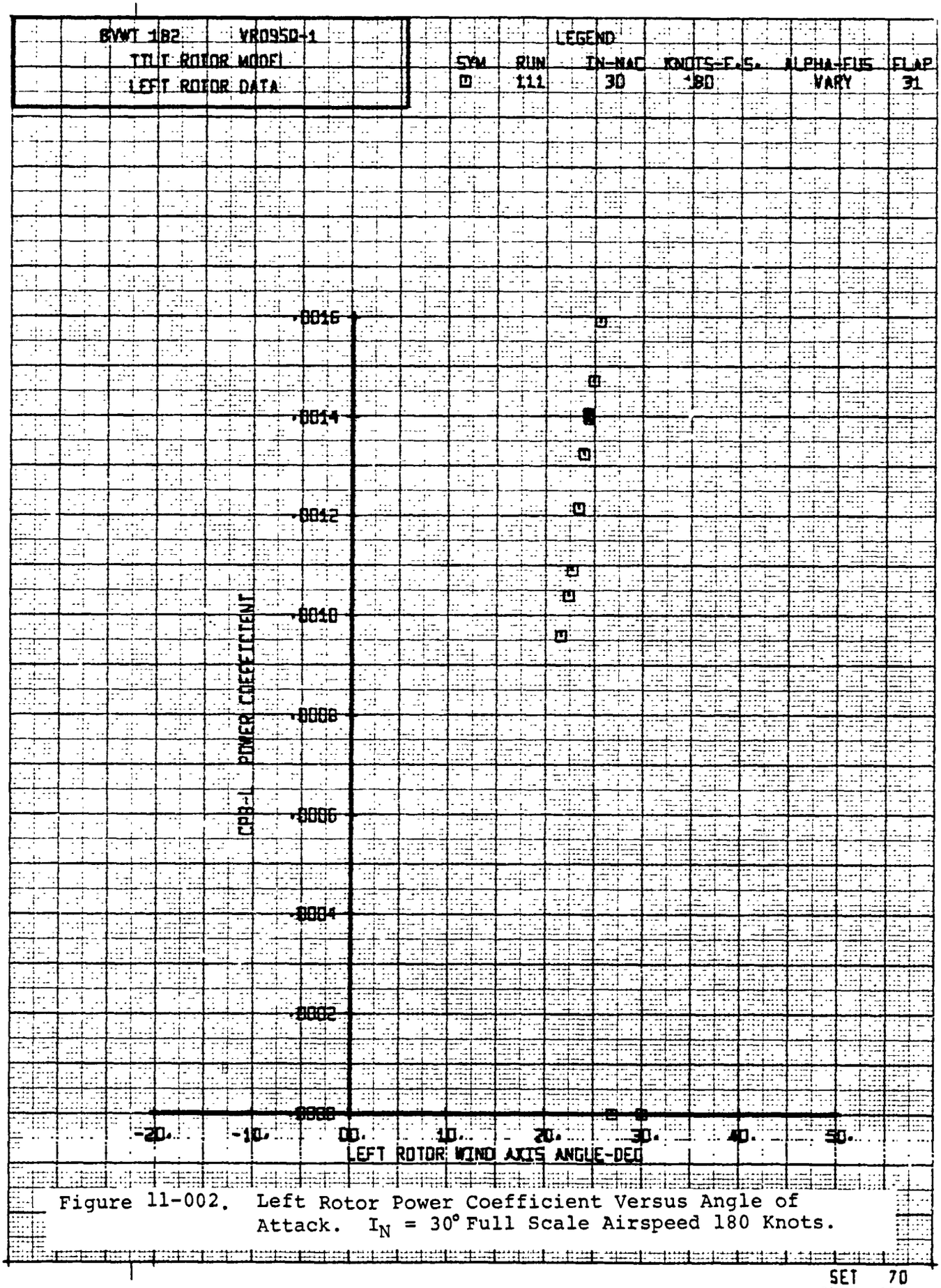


Figure 11-002. Left Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

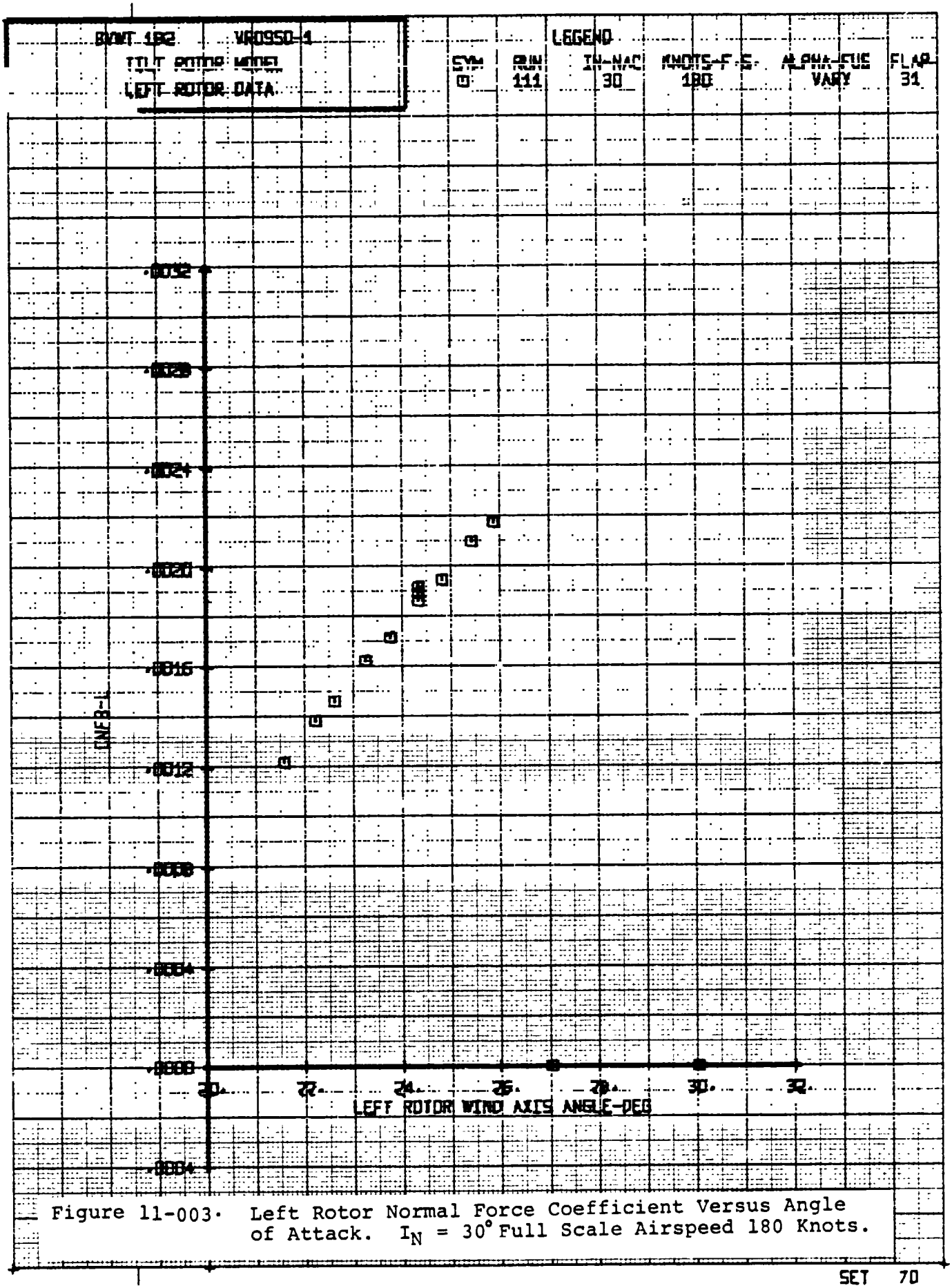


Figure 11-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

FT 70
1 182

SET 70
BVWT 182

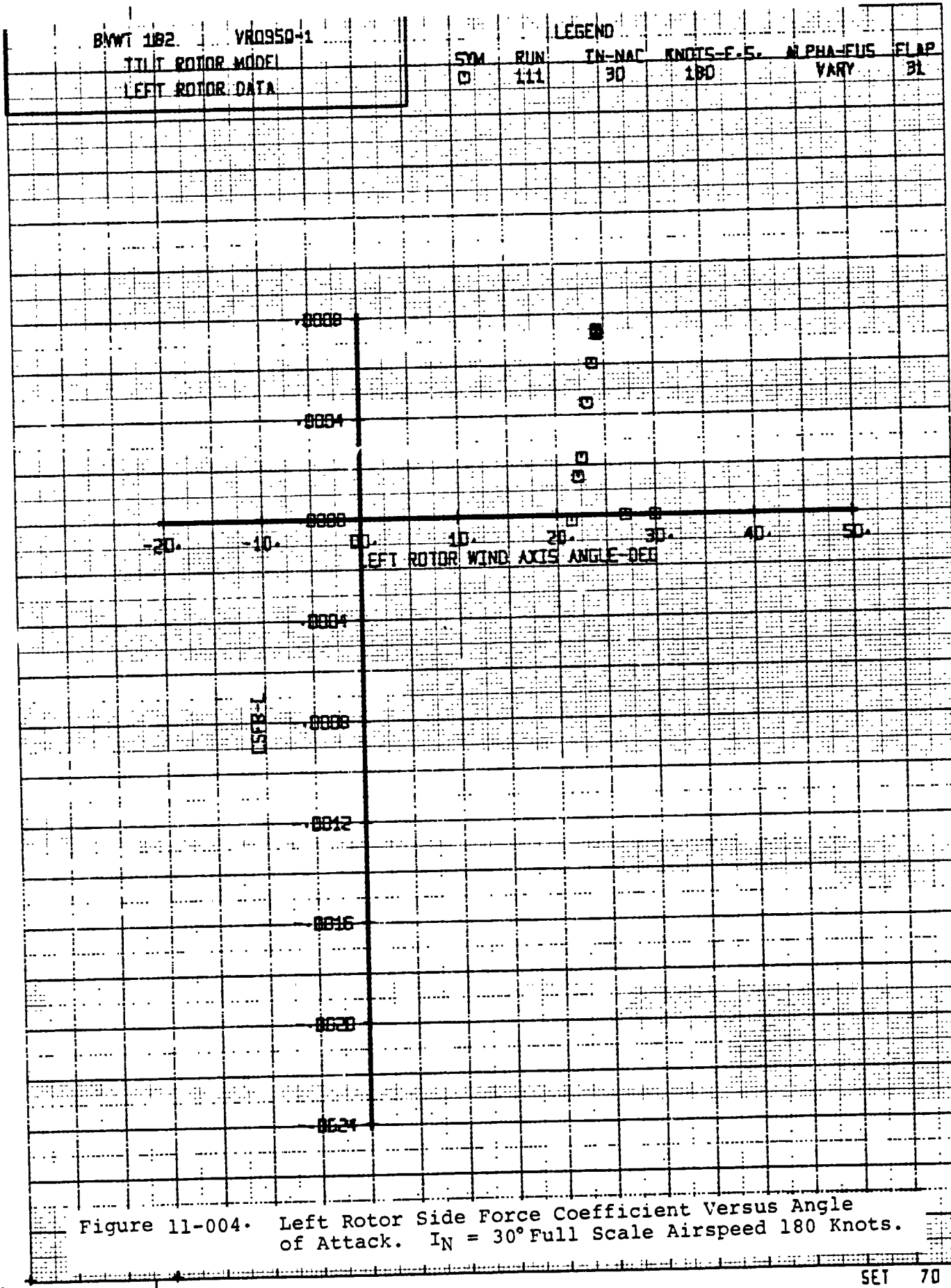


Figure 11-004. Left Rotor Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

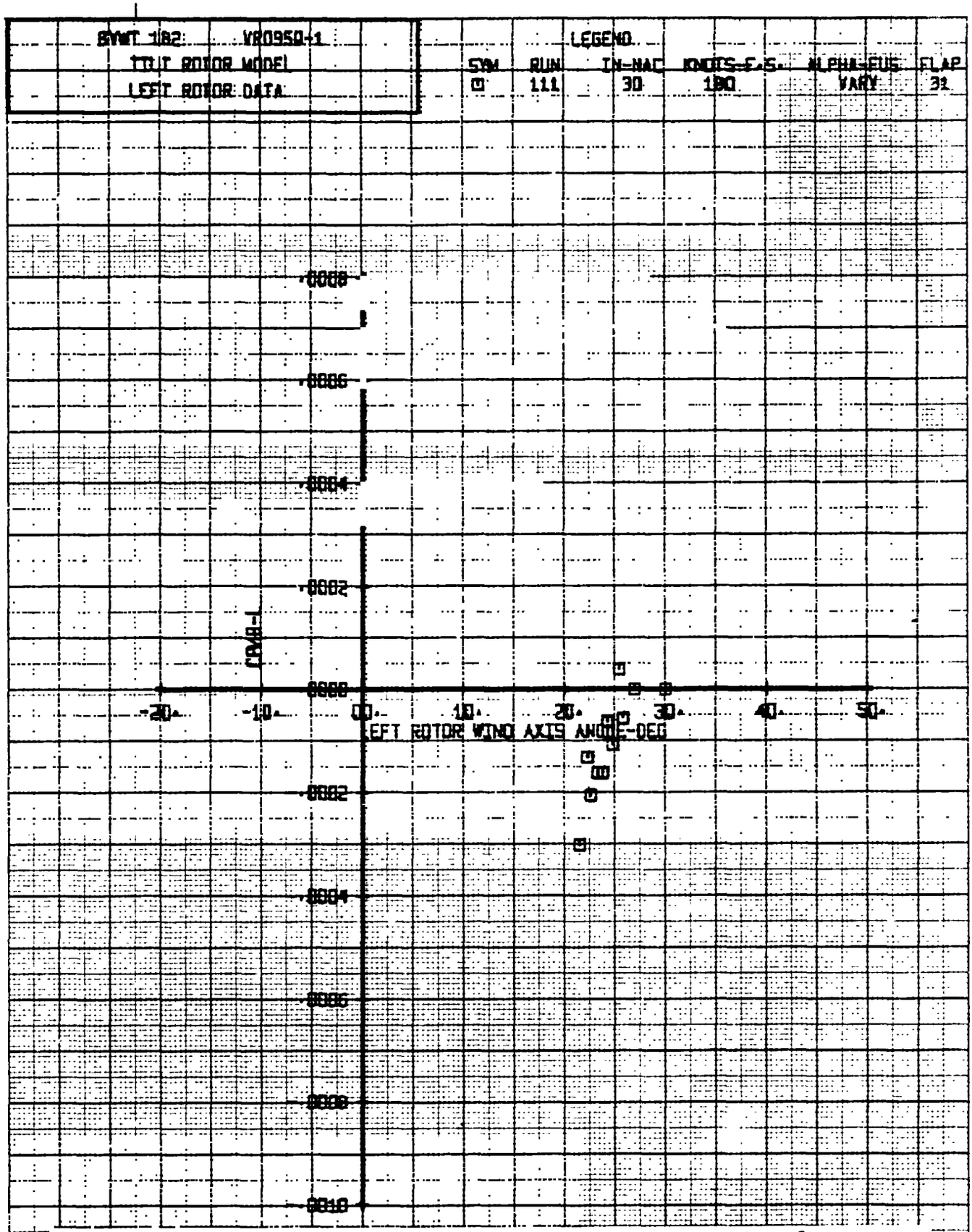


Figure 11-005. Left Rotor Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

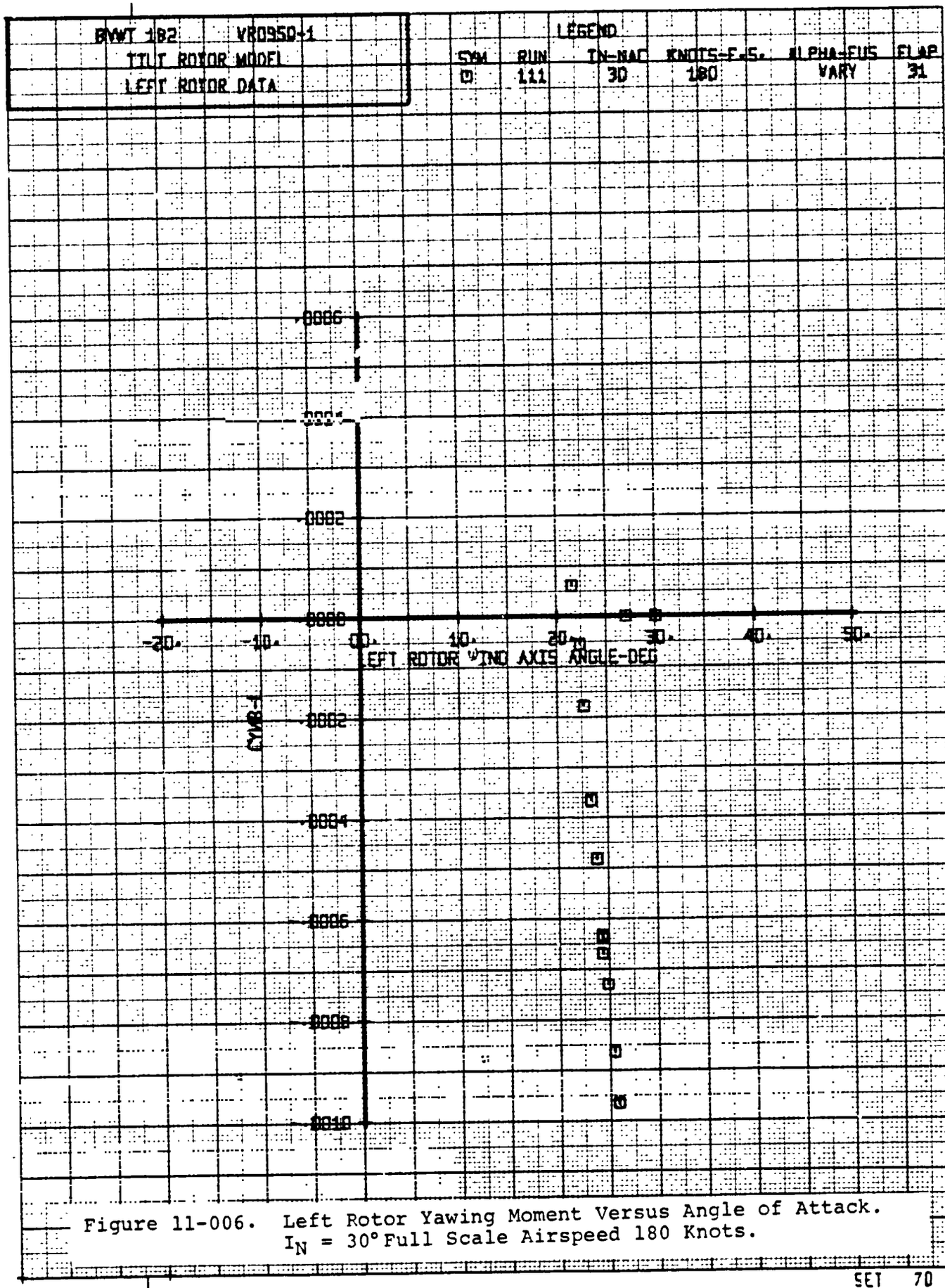


Figure 11-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

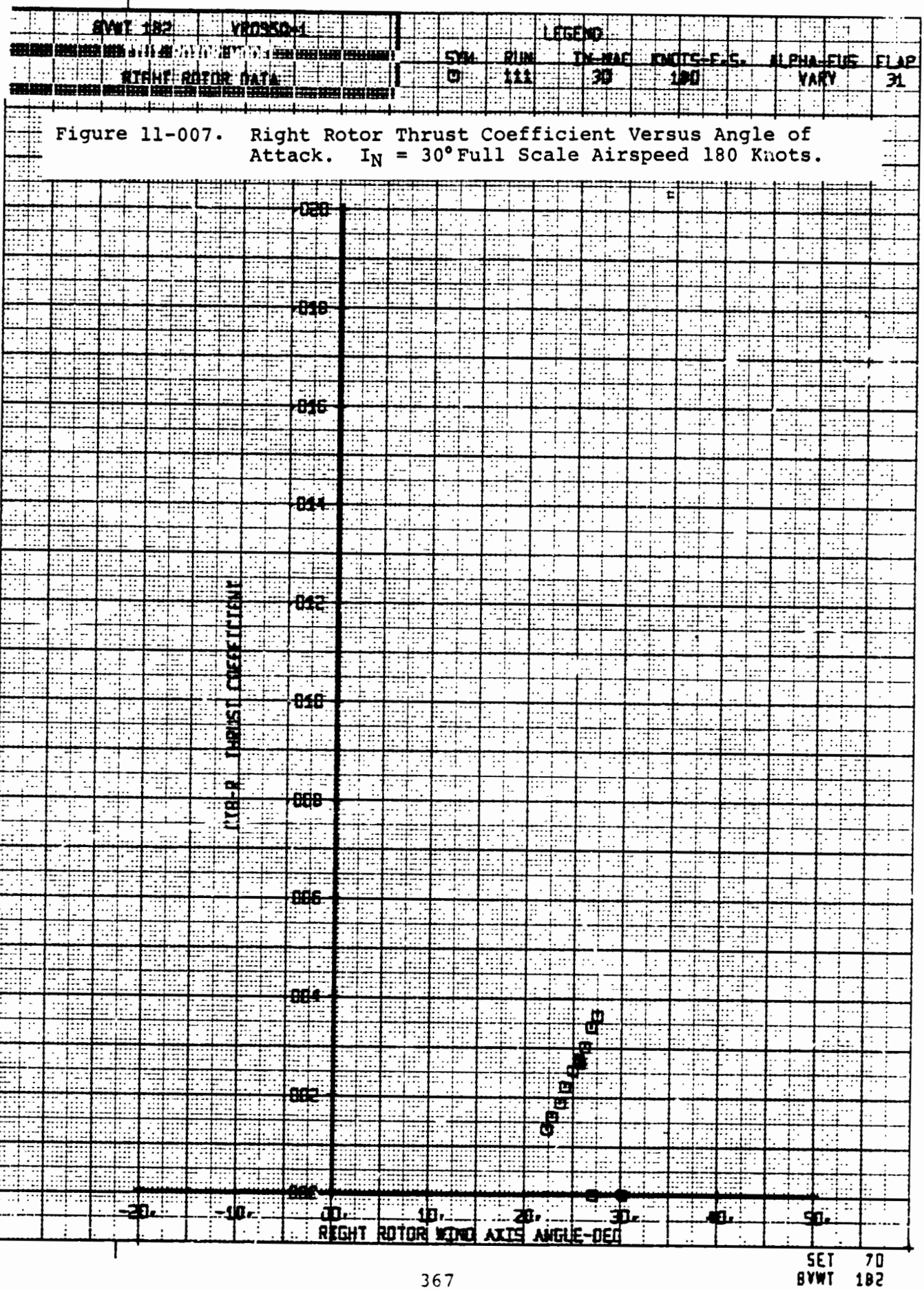


Figure 11-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

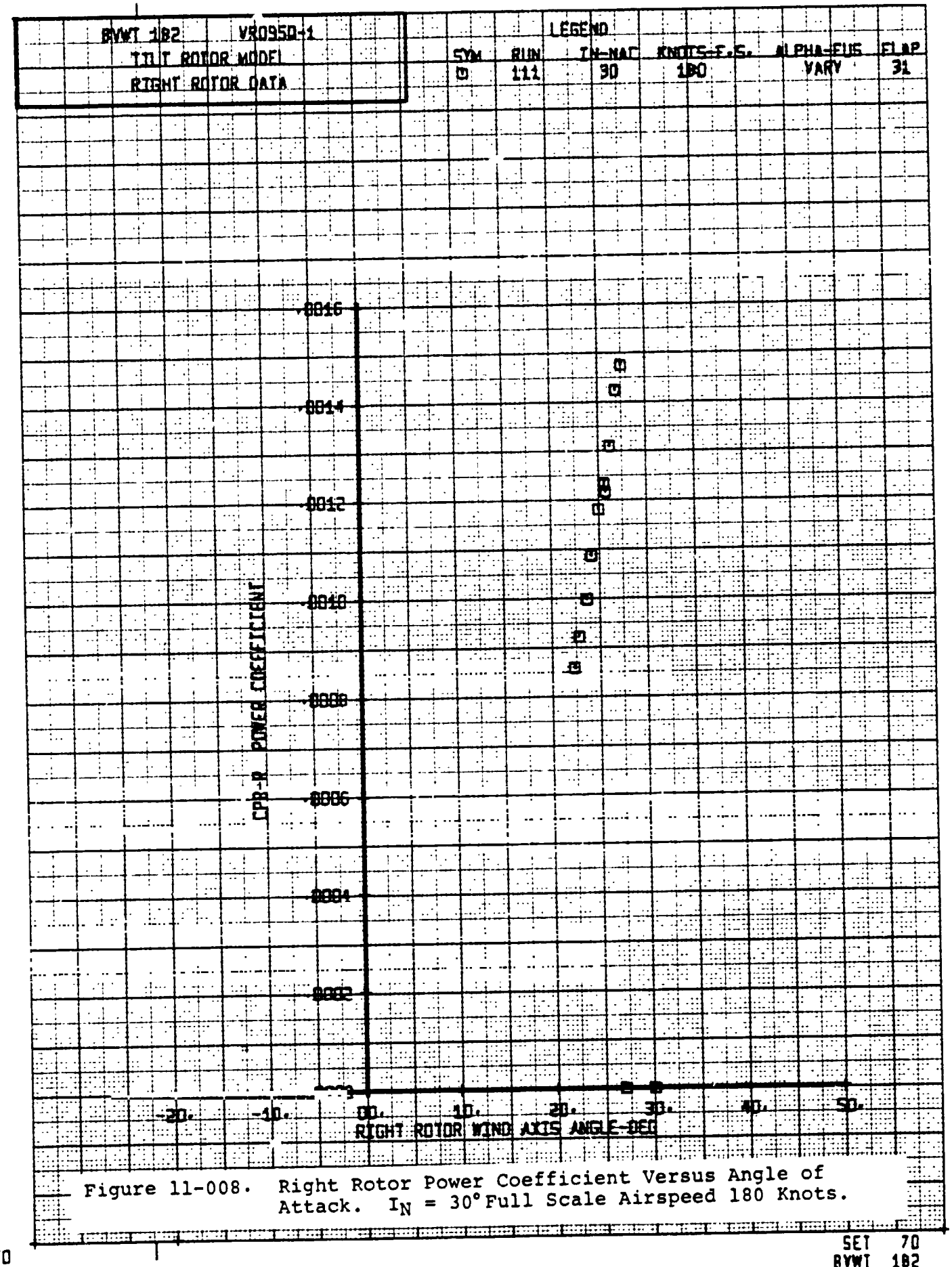


Figure 11-008. Right Rotor Power Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

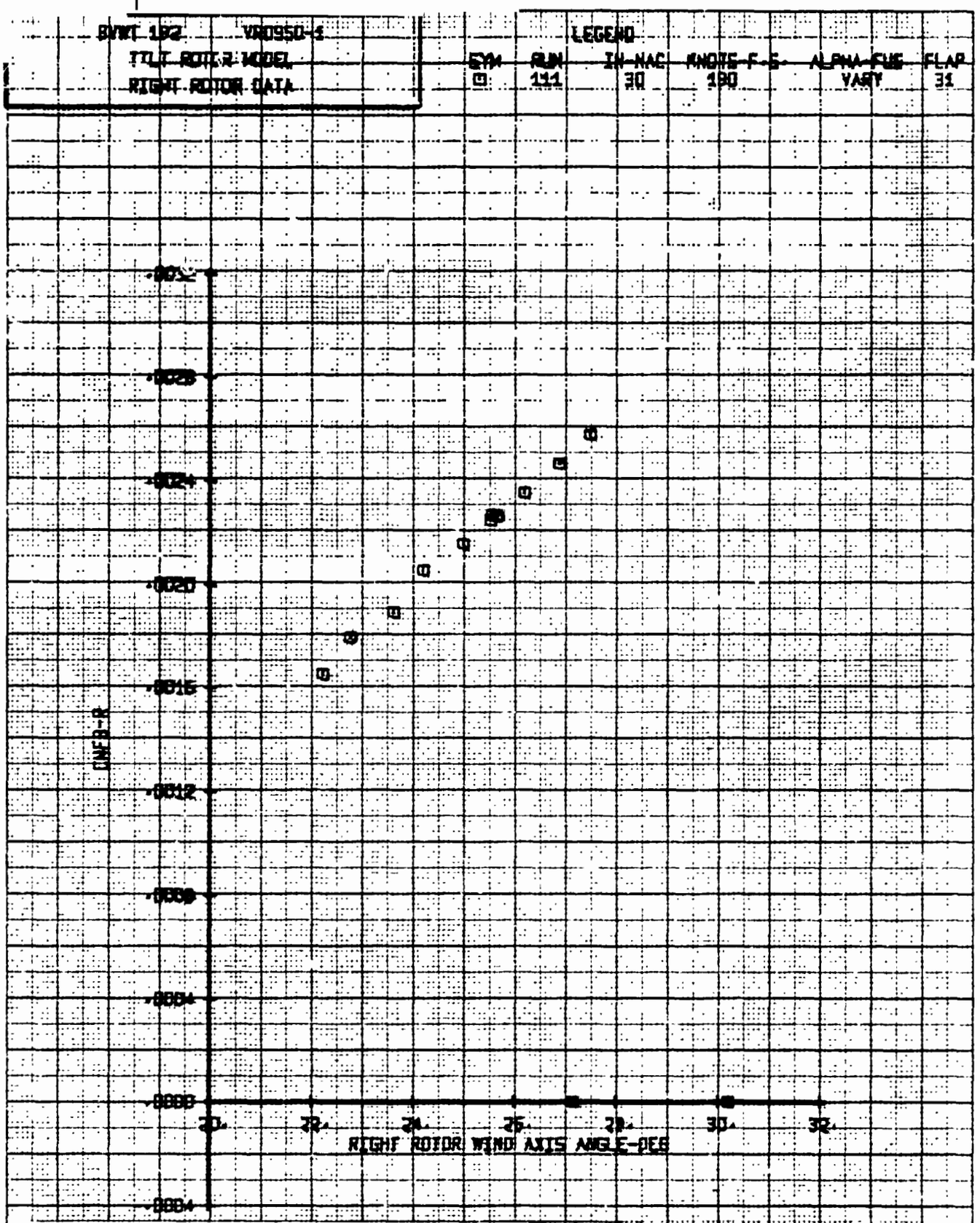


Figure 11-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

FT 70
V 182

SET 70
6VWT 182

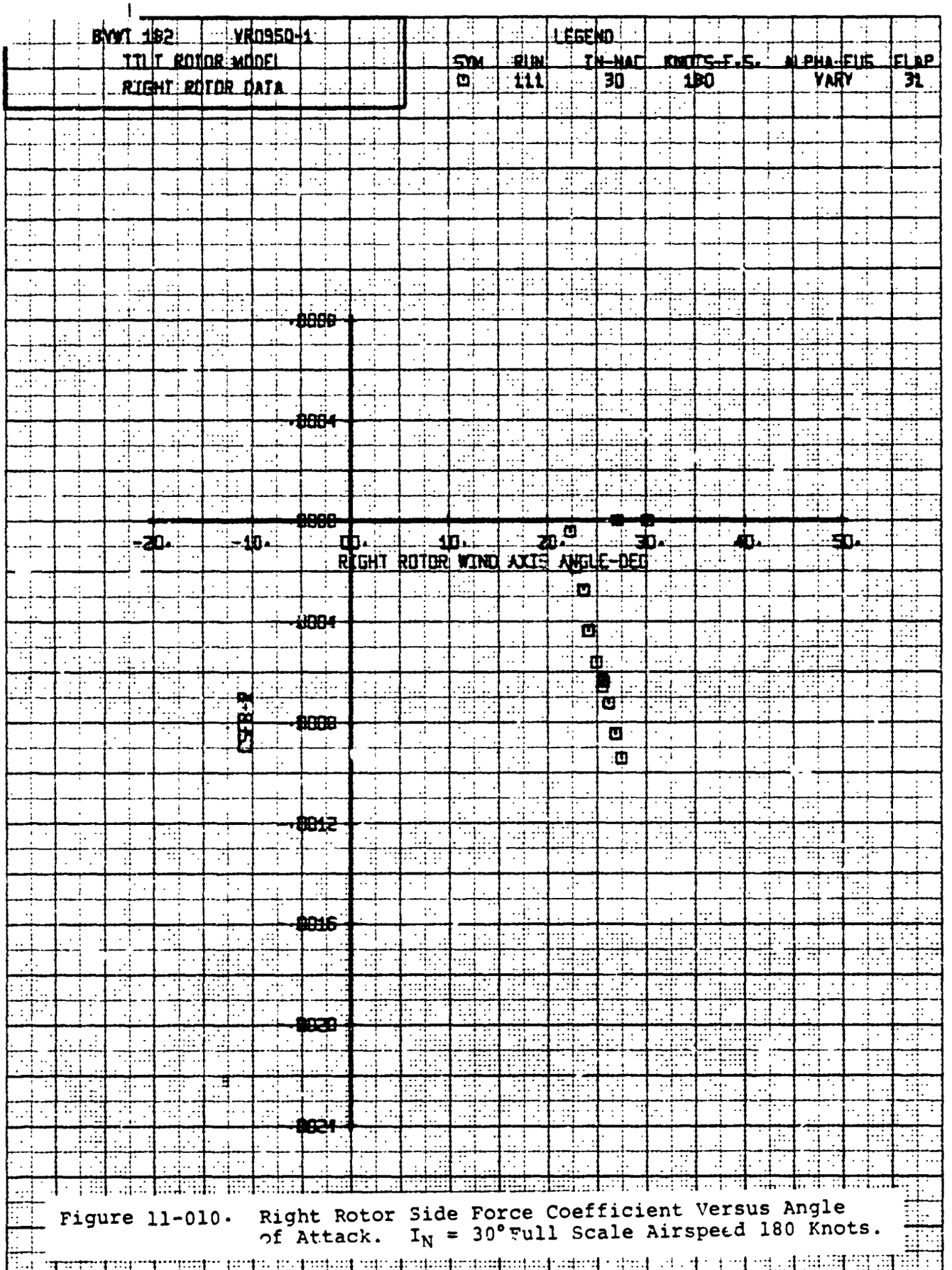


Figure 11-010. Right Rotor Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

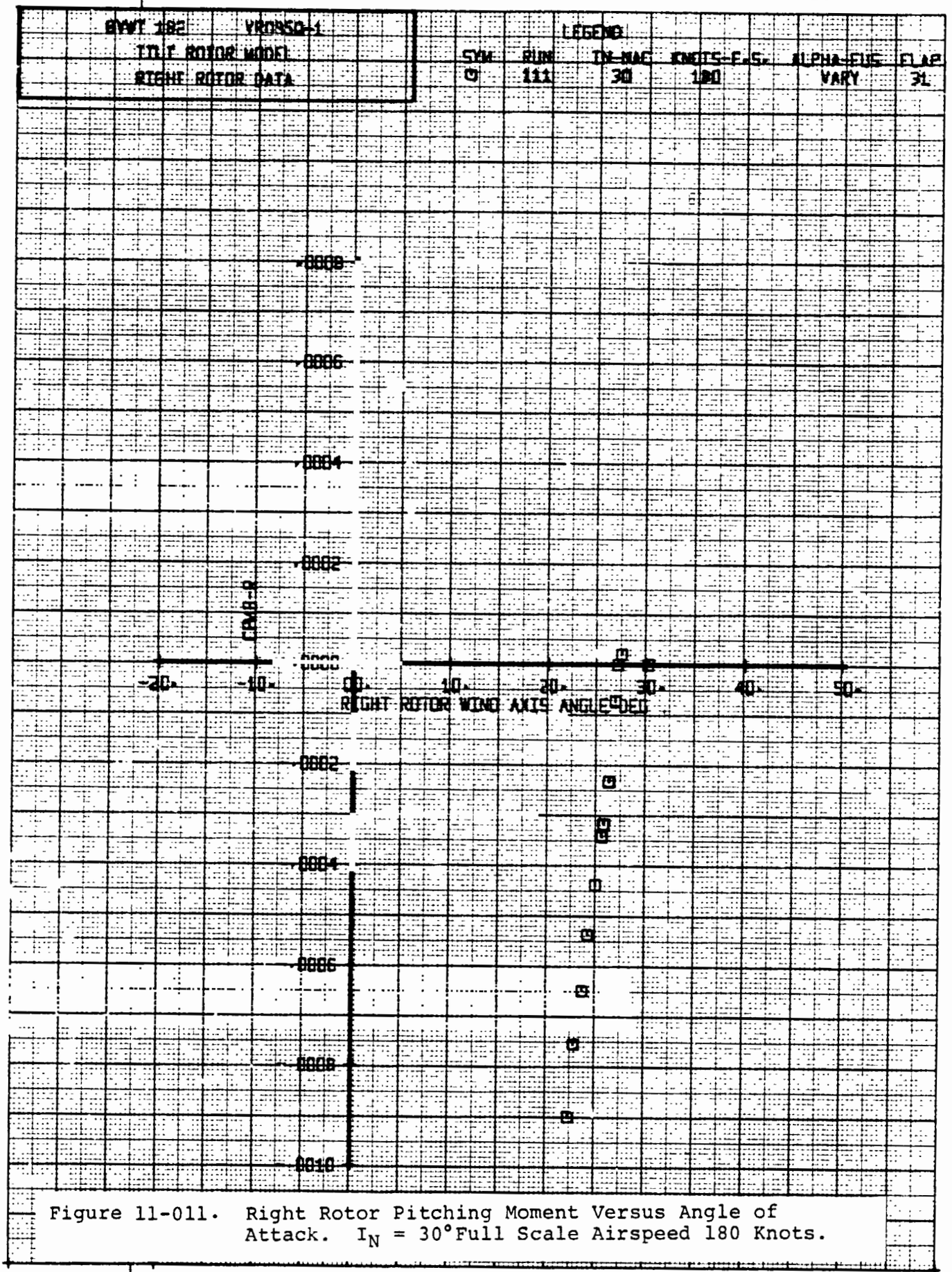


Figure 11-011. Right Rotor Pitching Moment Versus Angle of Attack. I_N = 30°Full Scale Airspeed 180 Knots.

FT 70
182

SET 70
BVWT 182

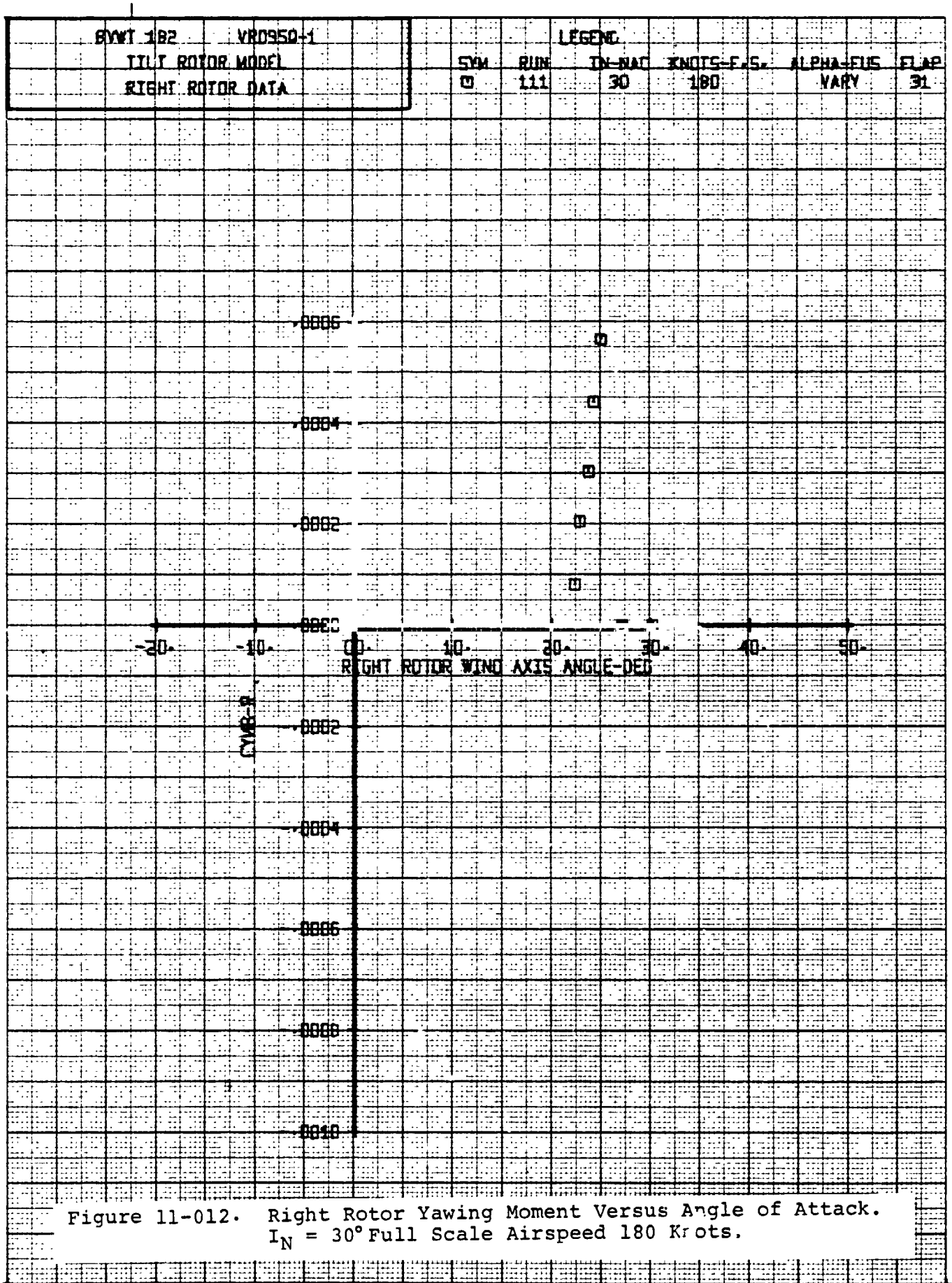


Figure 11-012. Right Rotor Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

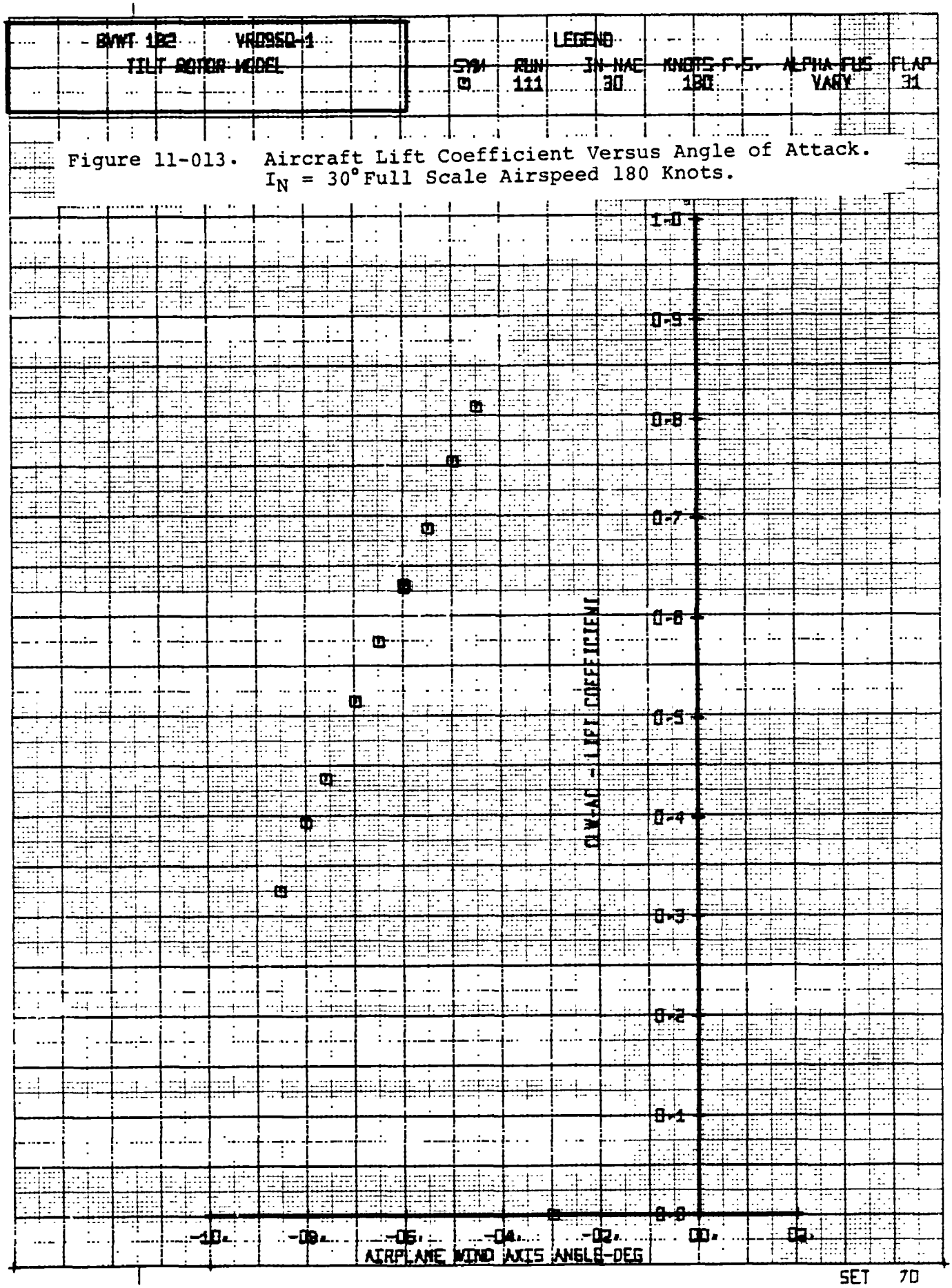


Figure 11-013. Aircraft Lift Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

FT 70
V 182

SET 70
BVWT 182

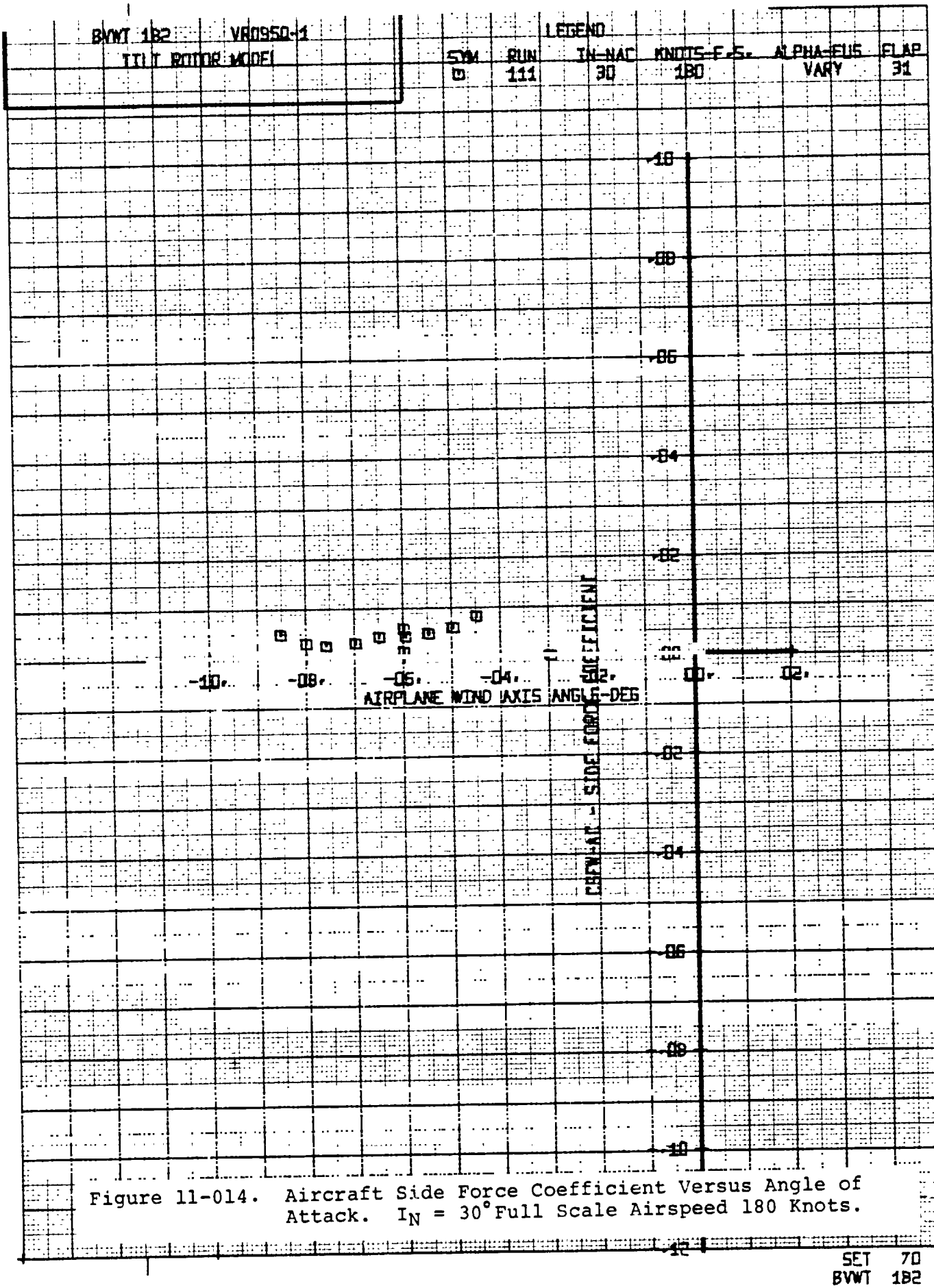


Figure 11-014. Aircraft Side Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

70
182

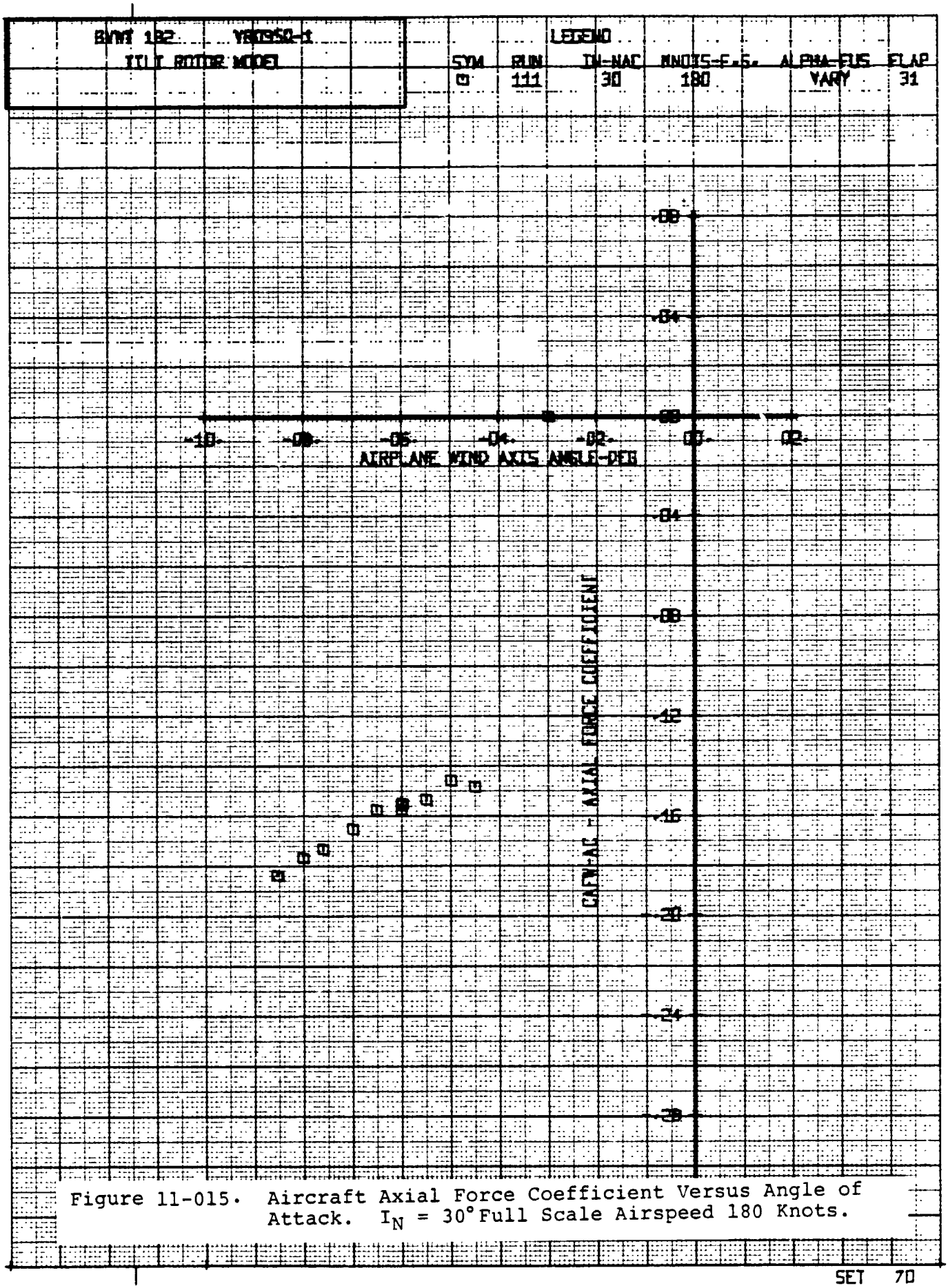


Figure 11-015. Aircraft Axial Force Coefficient Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

ET 70
W 182

SET 70
BWT 182

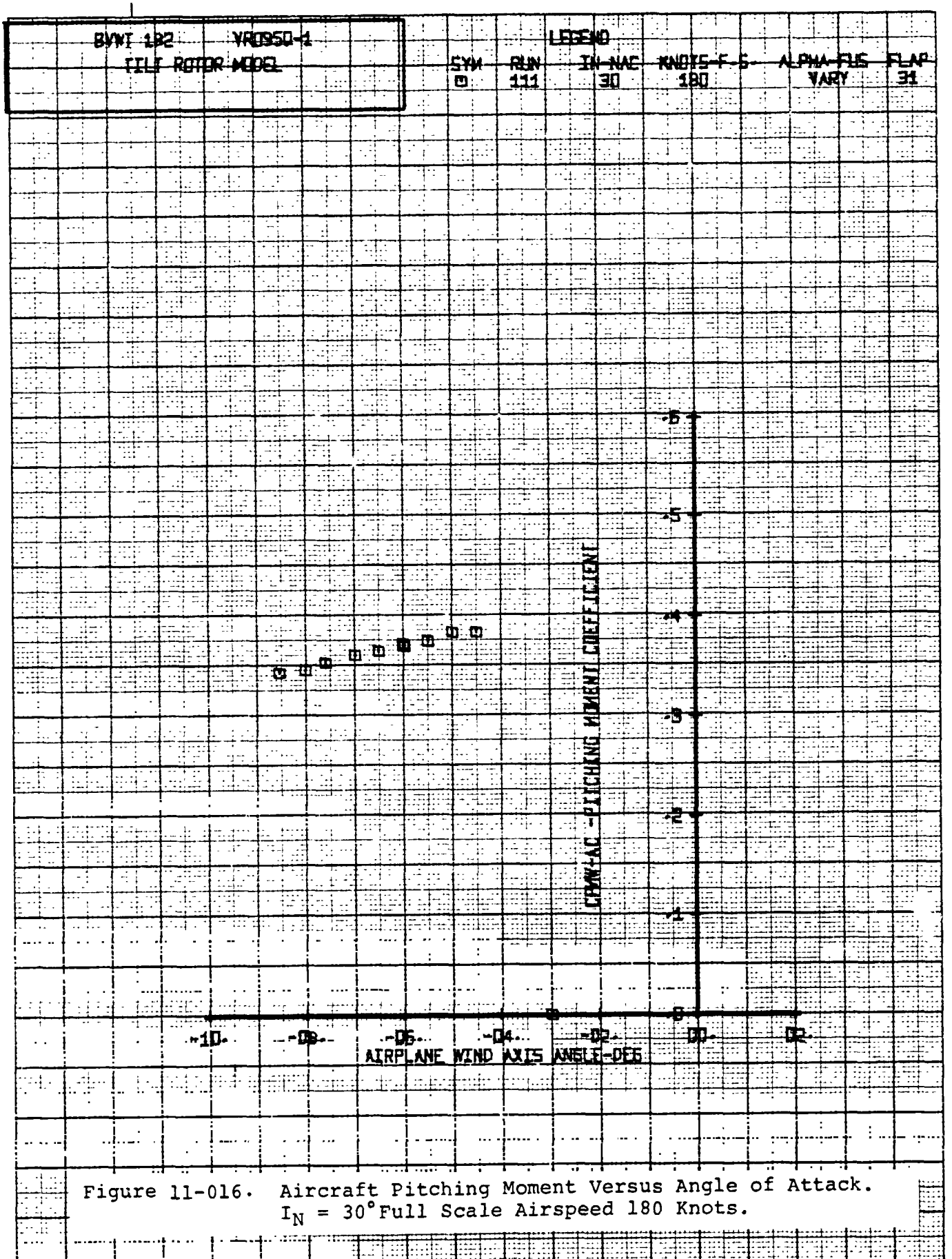


Figure 11-016. Aircraft Pitching Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

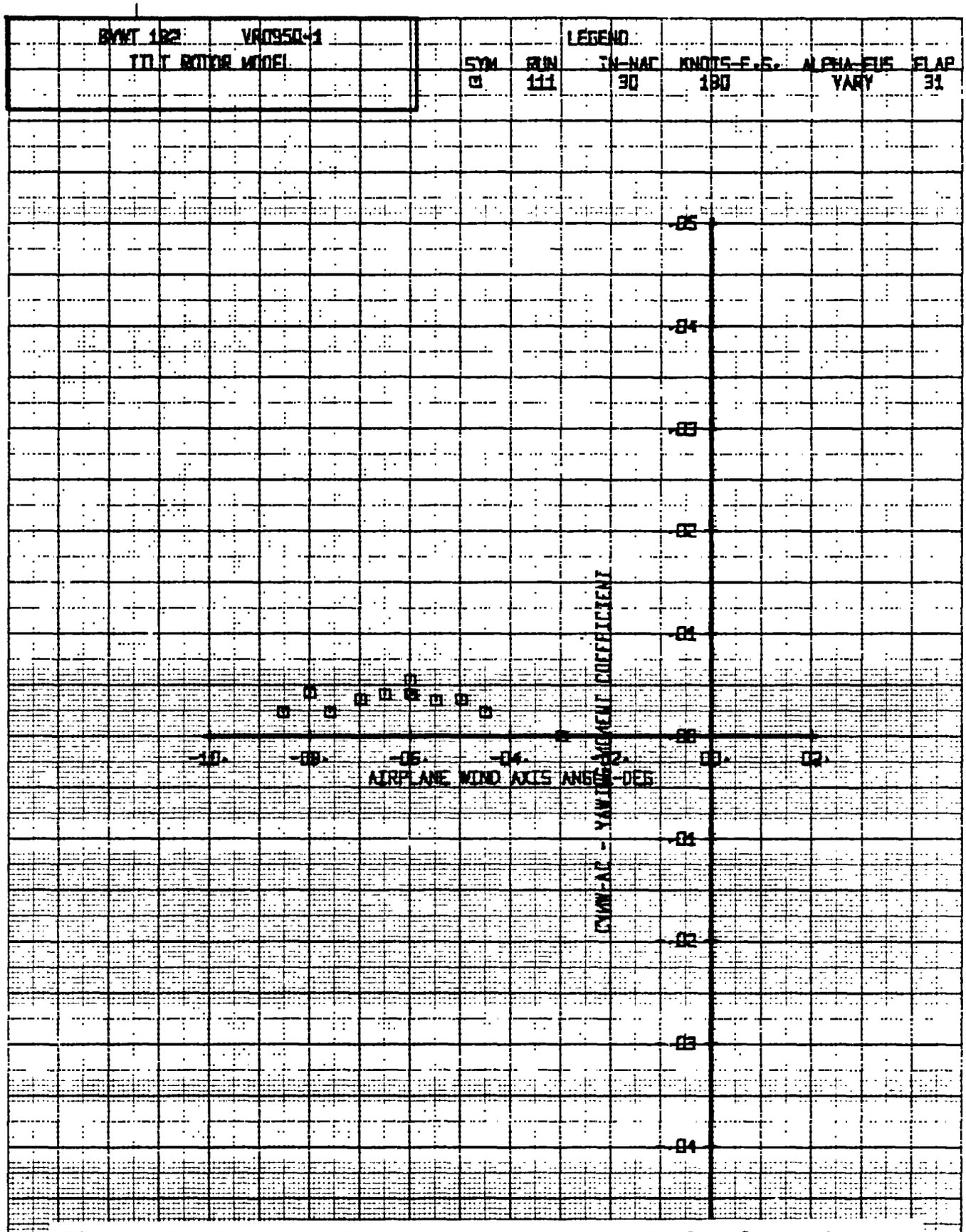


Figure 11-017. Aircraft Yawing Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

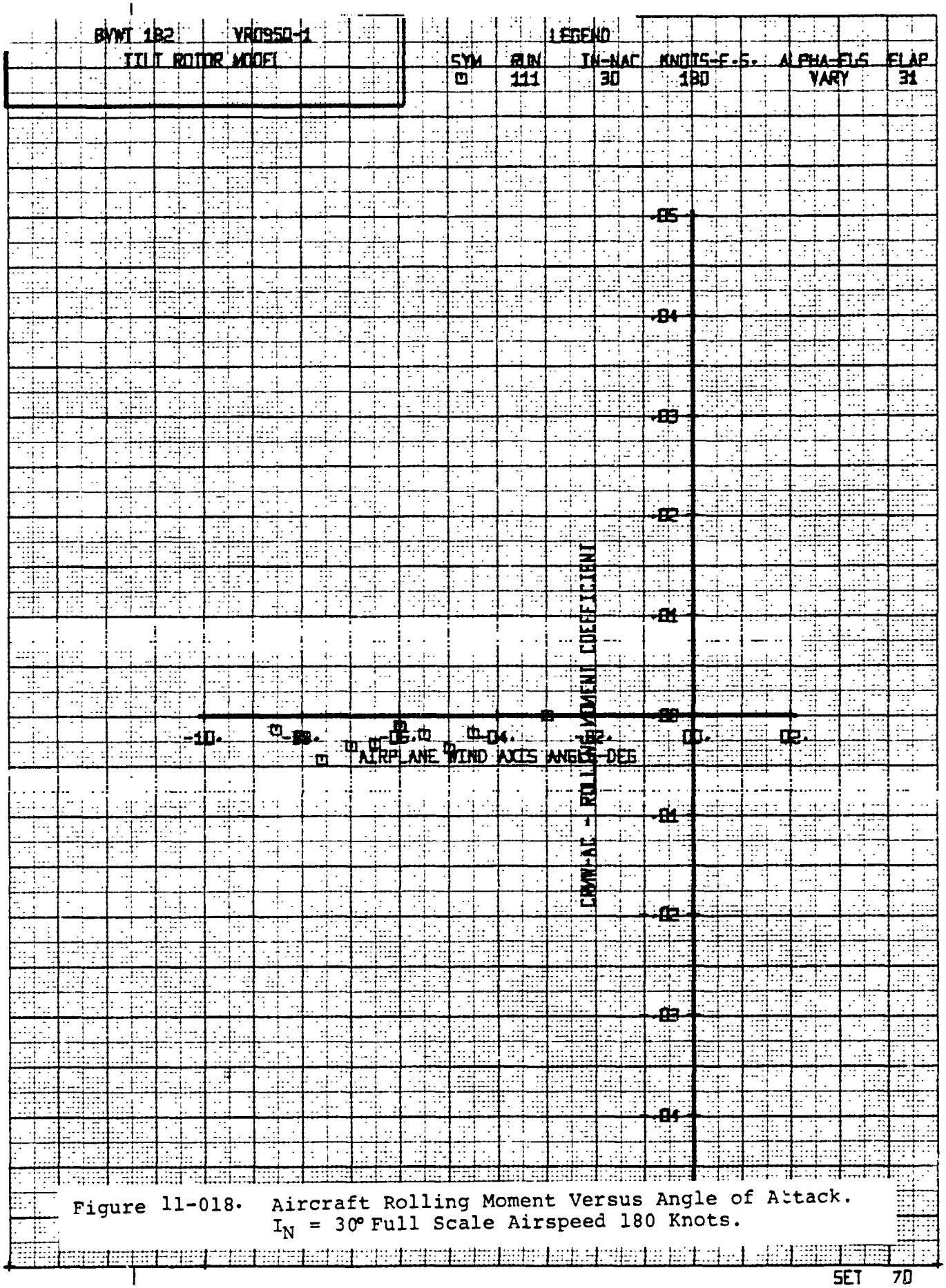


Figure 11-018. Aircraft Rolling Moment Versus Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

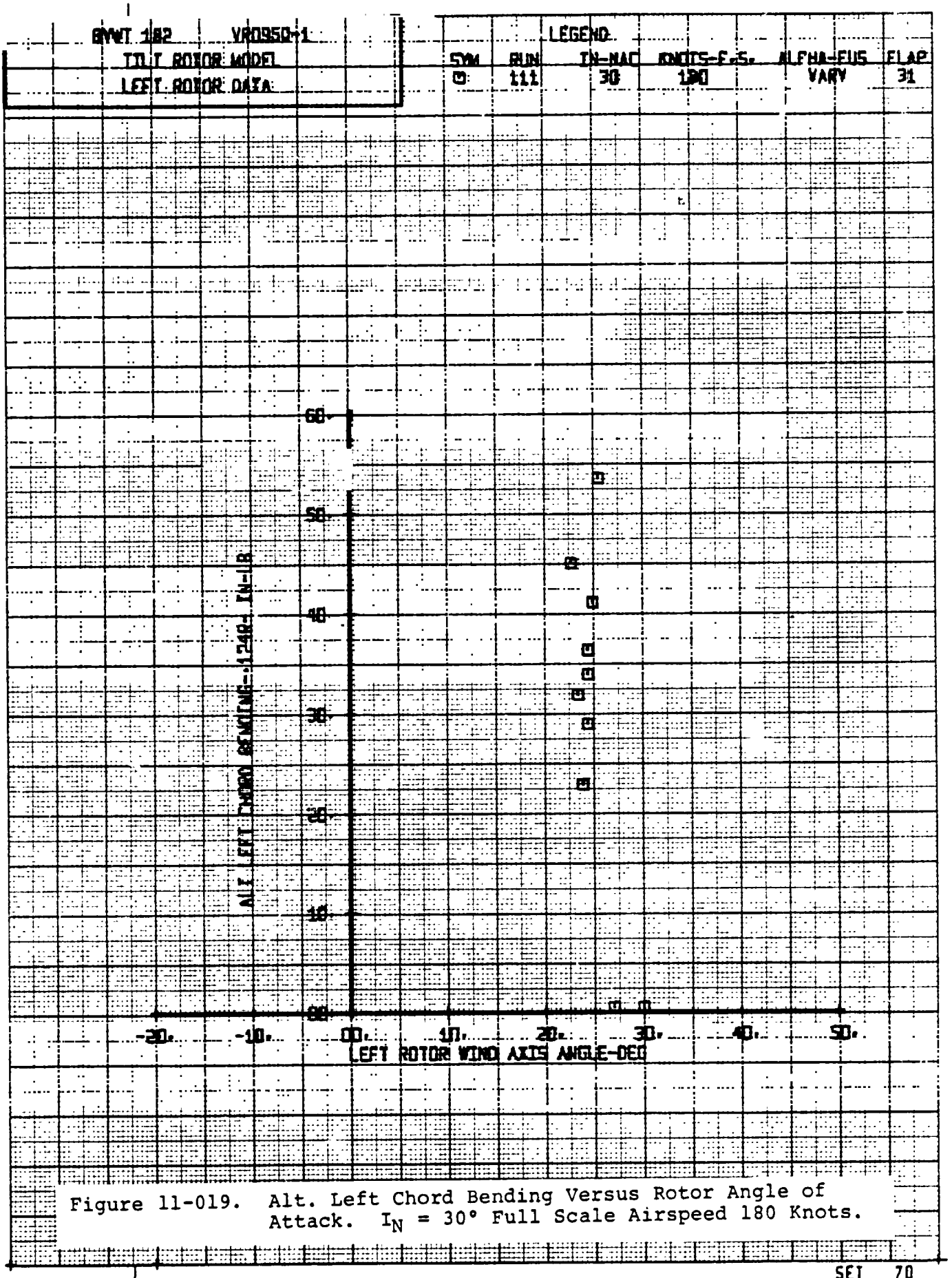


Figure 11-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

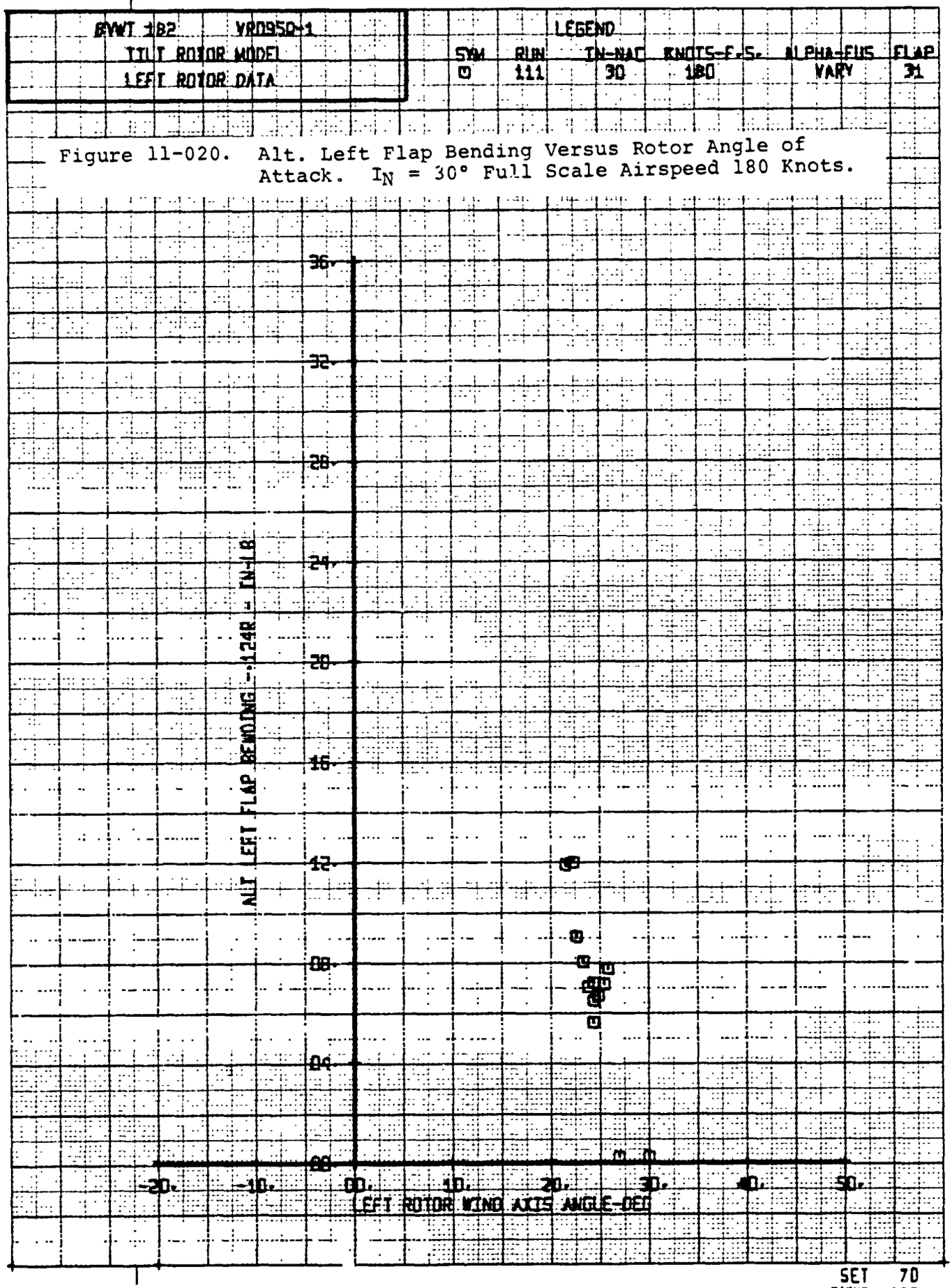


Figure 11-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

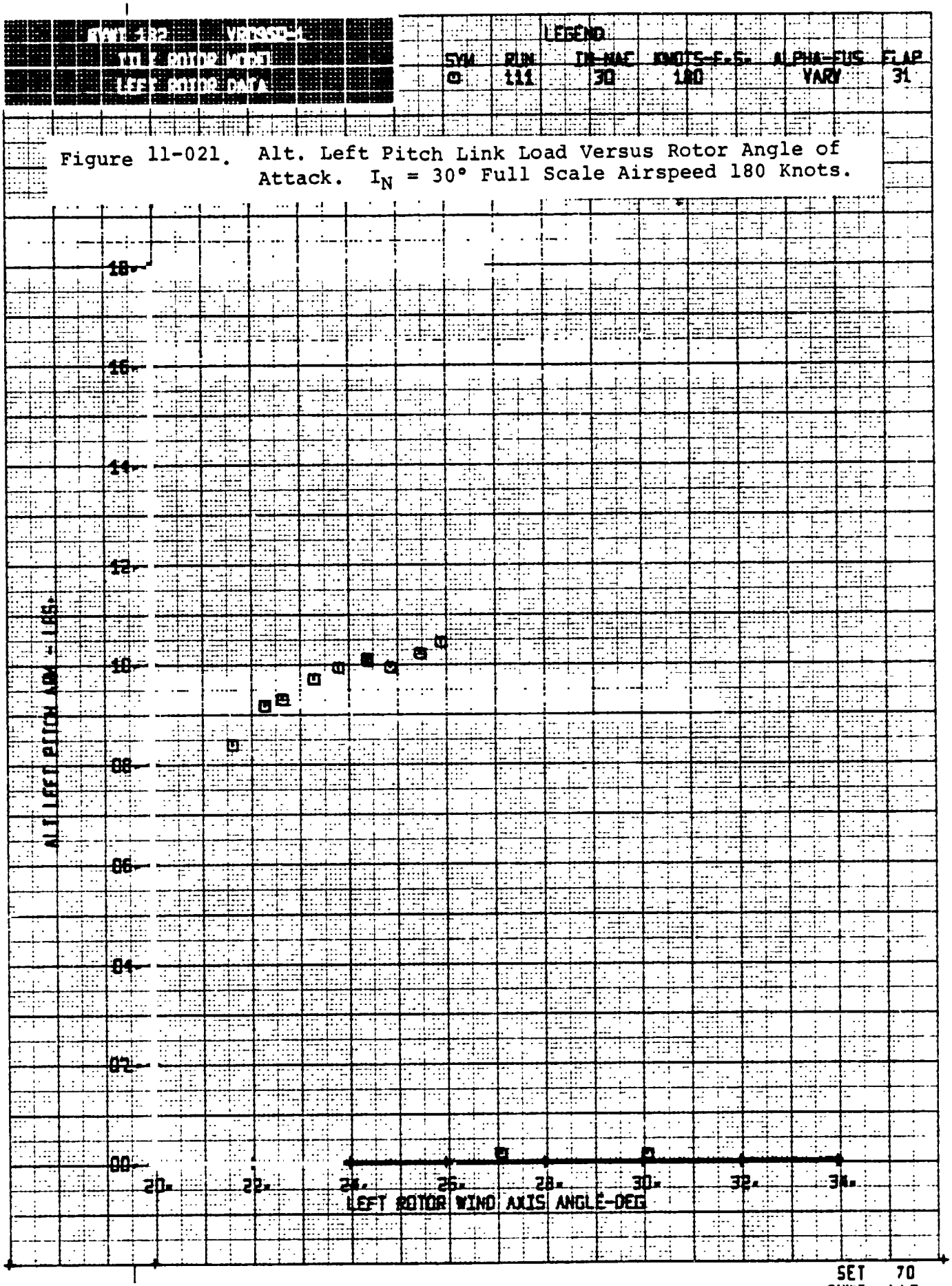


Figure 11-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

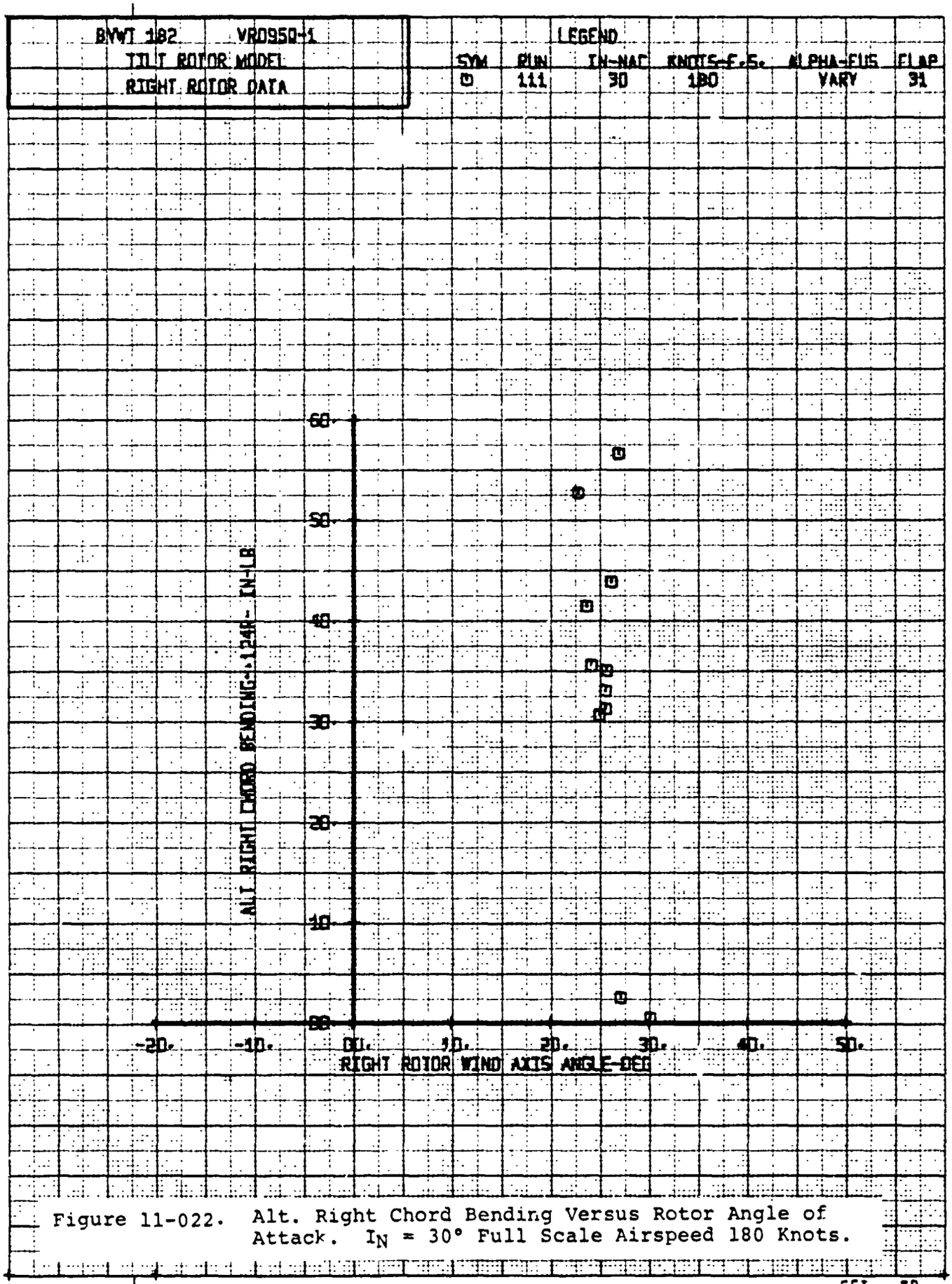


Figure 11-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

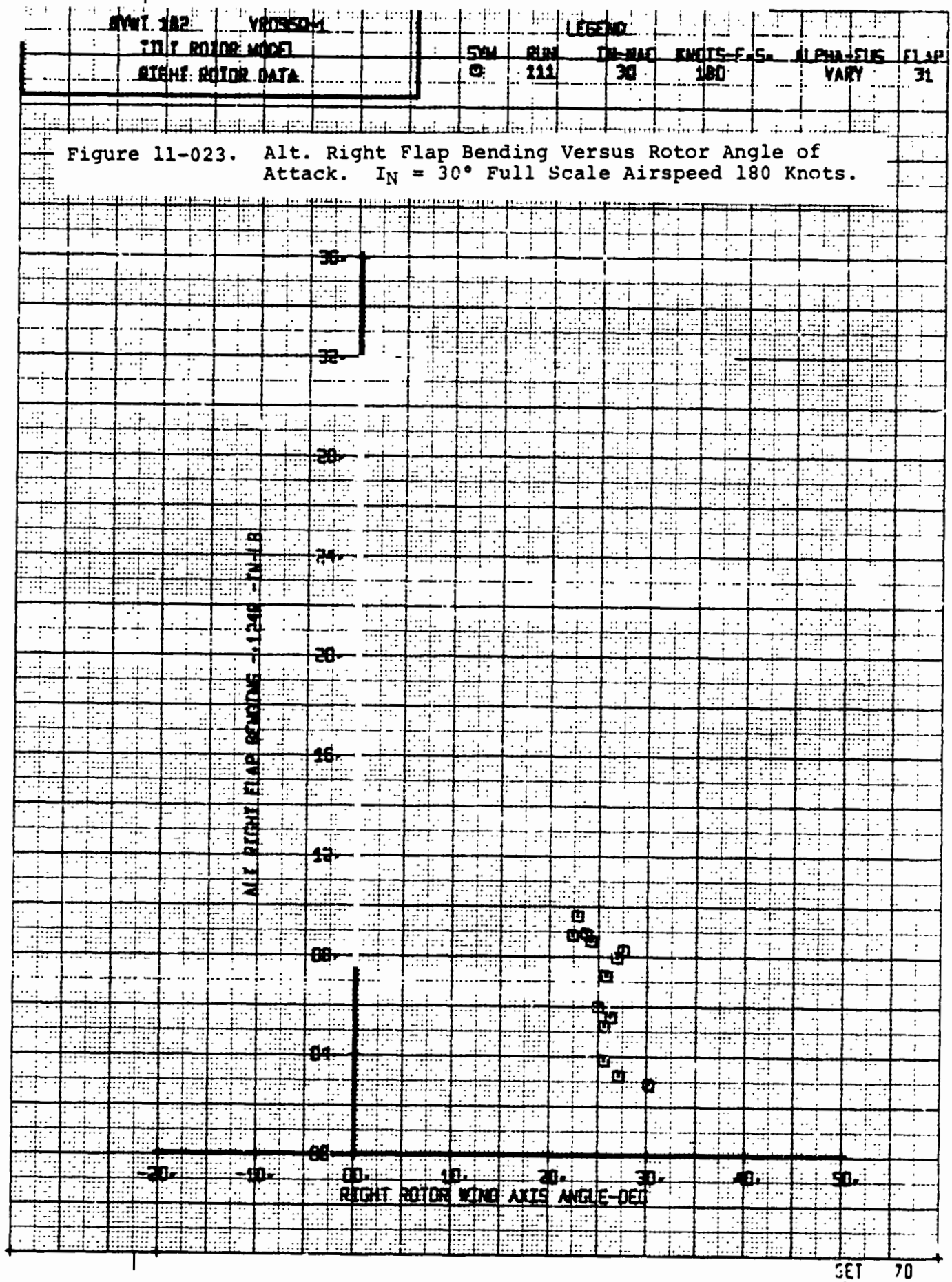


Figure 11-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

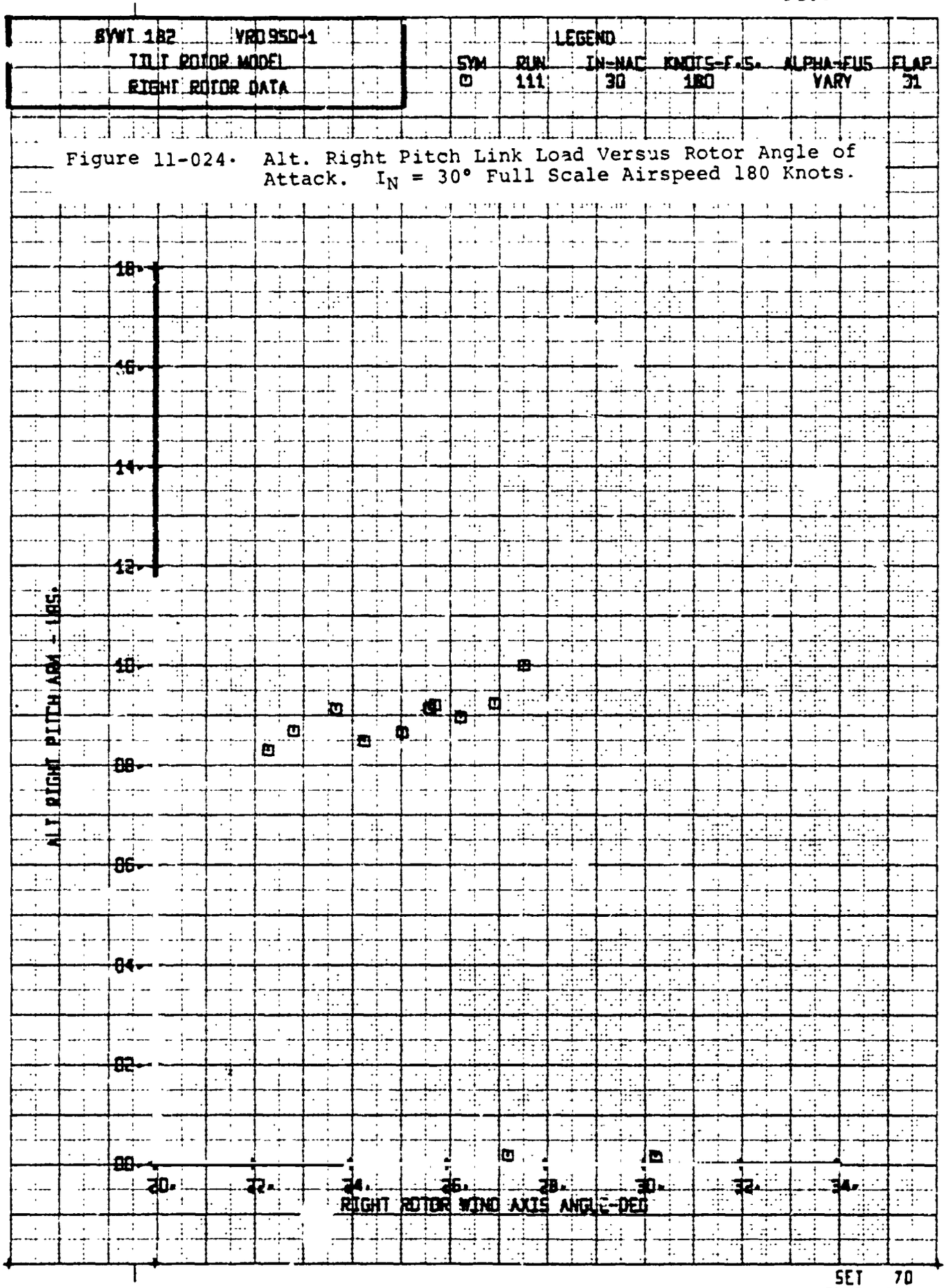


Figure 11-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. I_N = 30° Full Scale Airspeed 180 Knots.

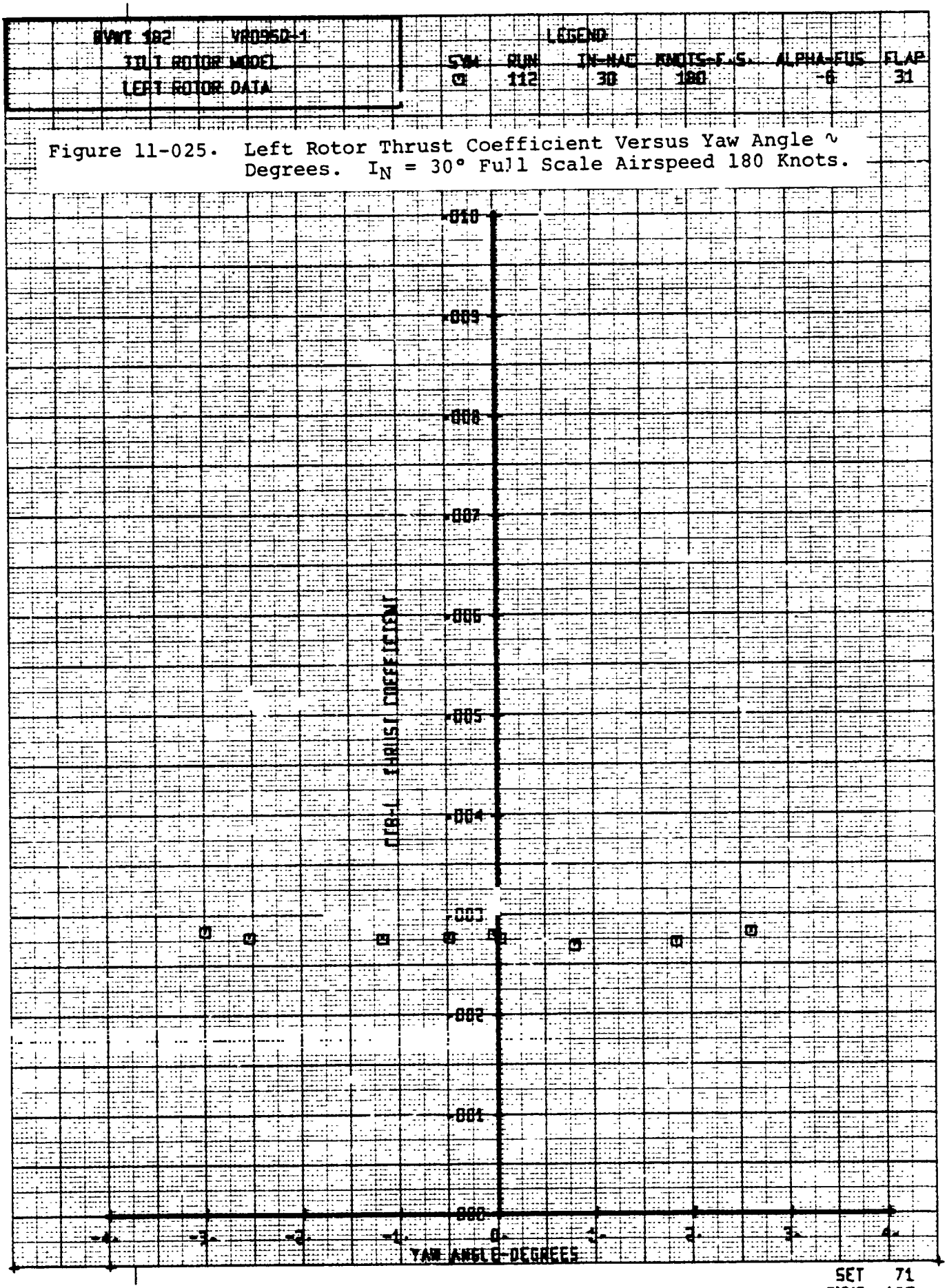


Figure 11-025. Left Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 71
BVWT 182

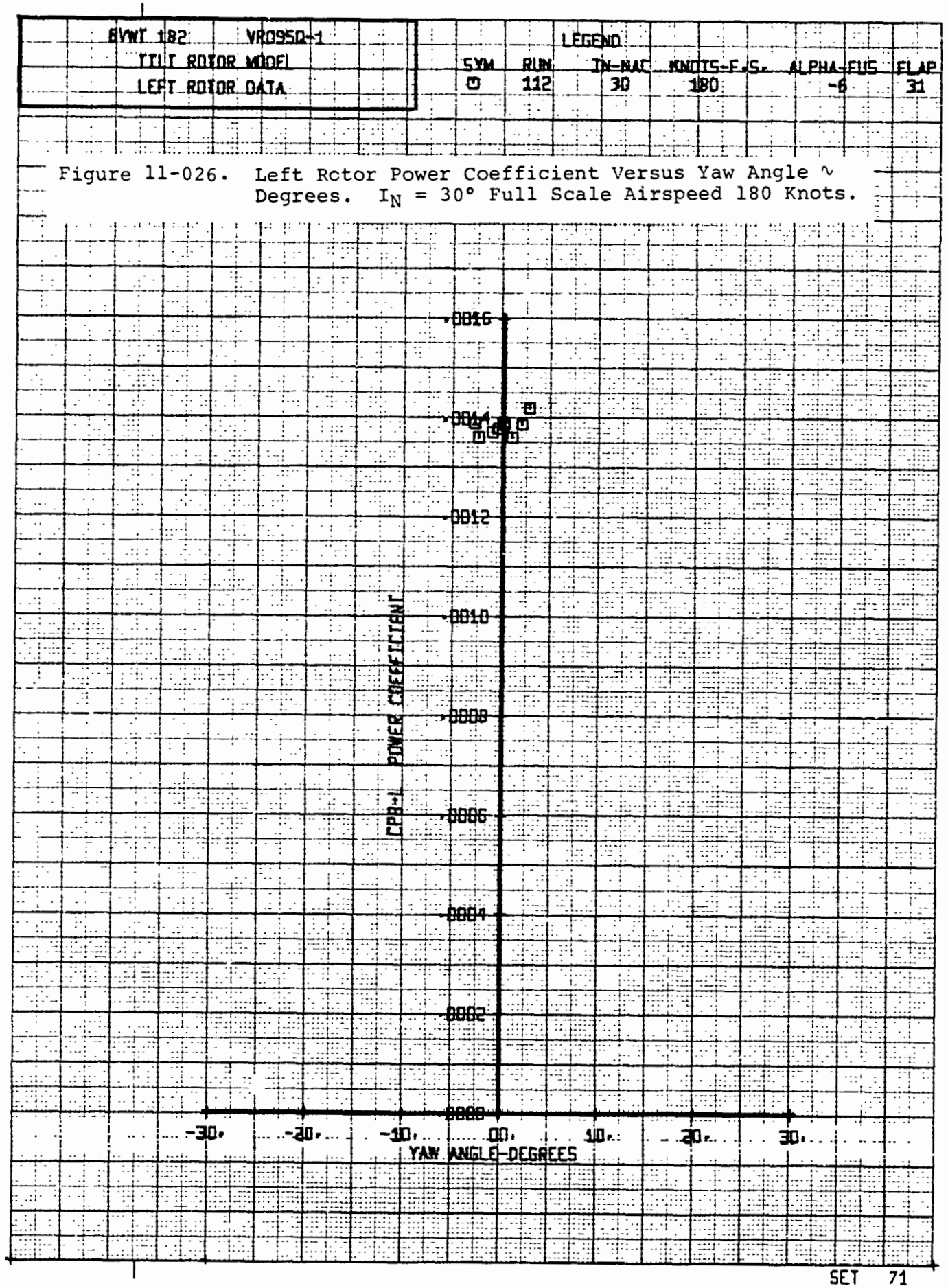


Figure 11-026. Left Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

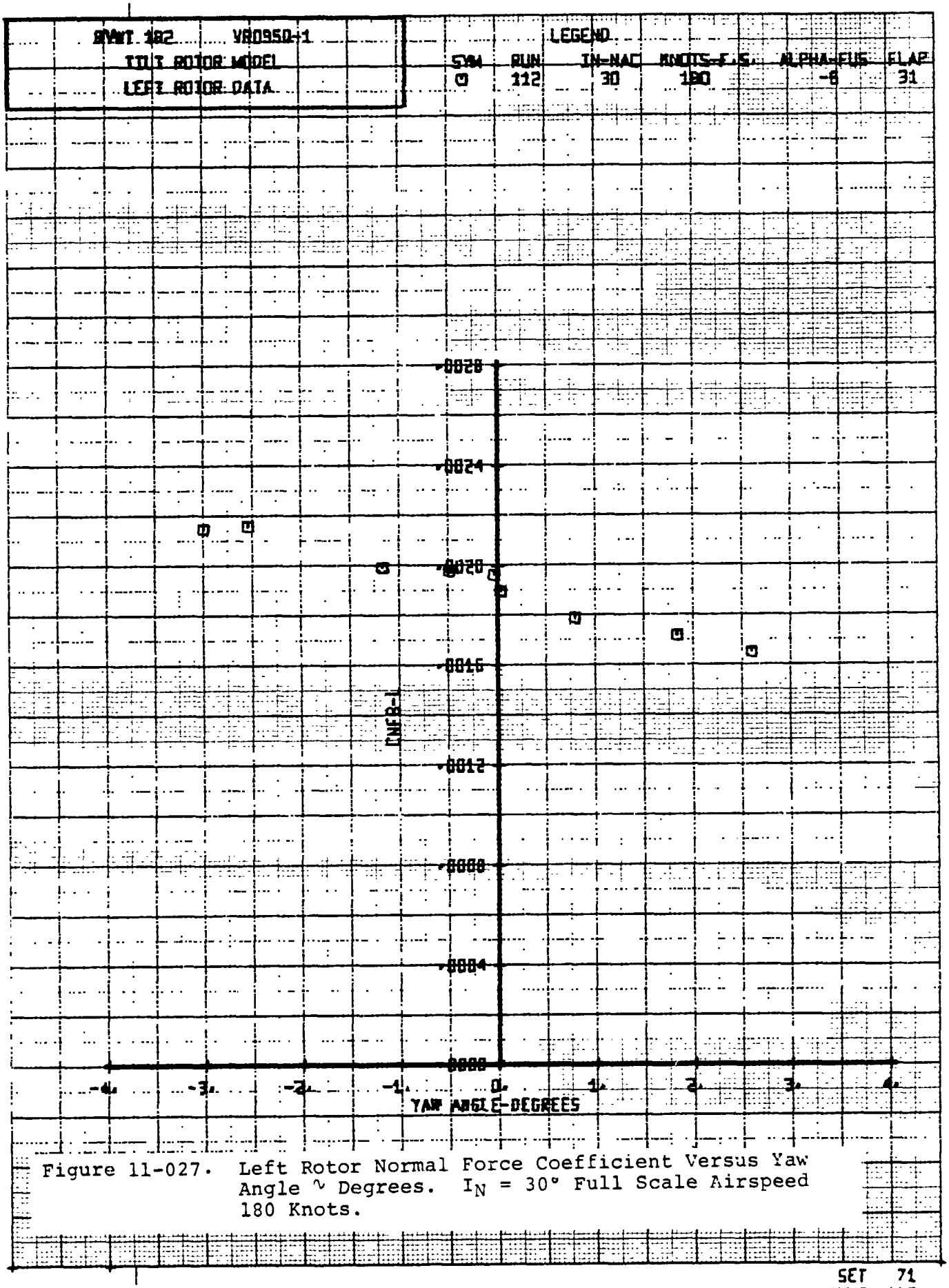


Figure 11-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

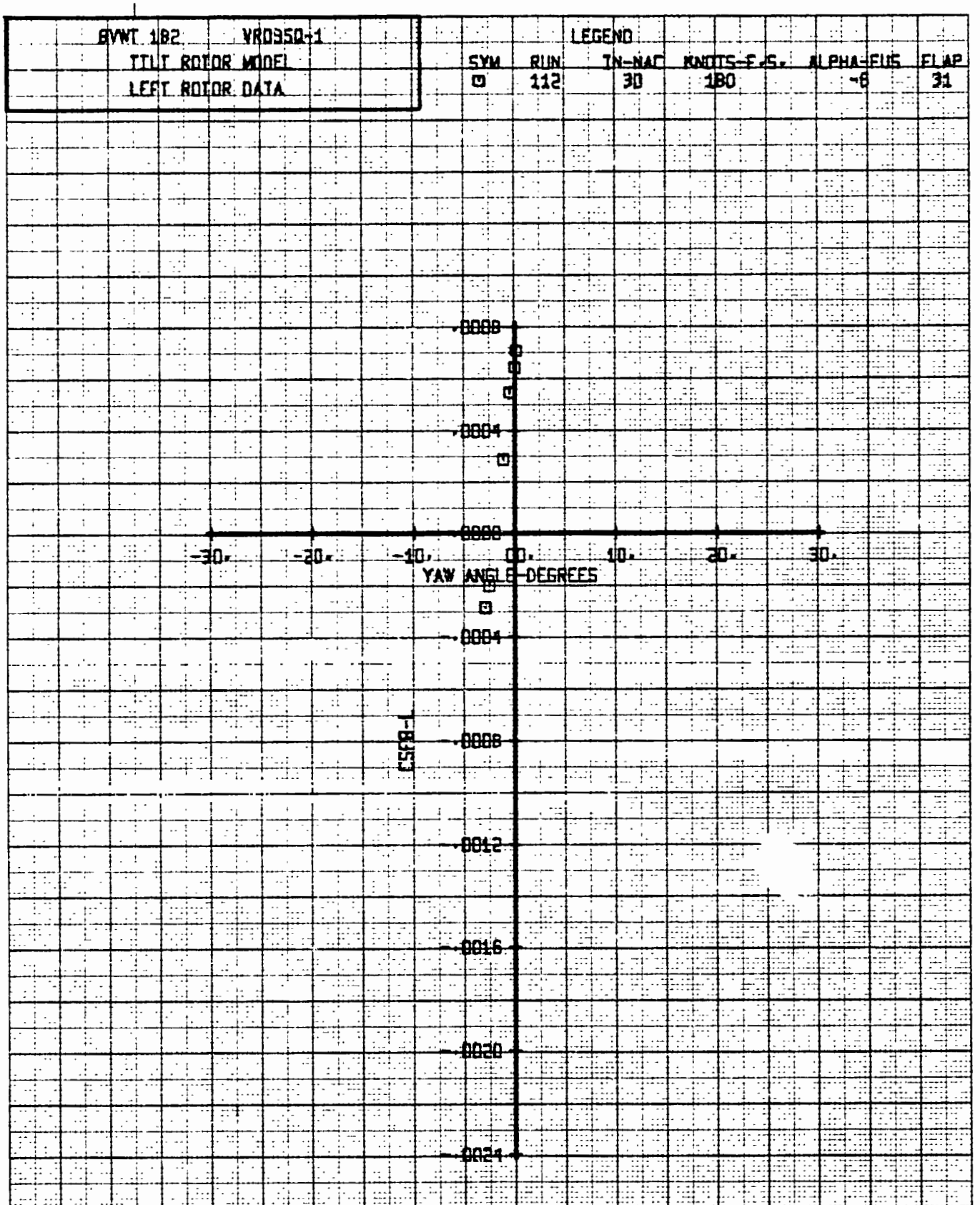


Figure 11-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

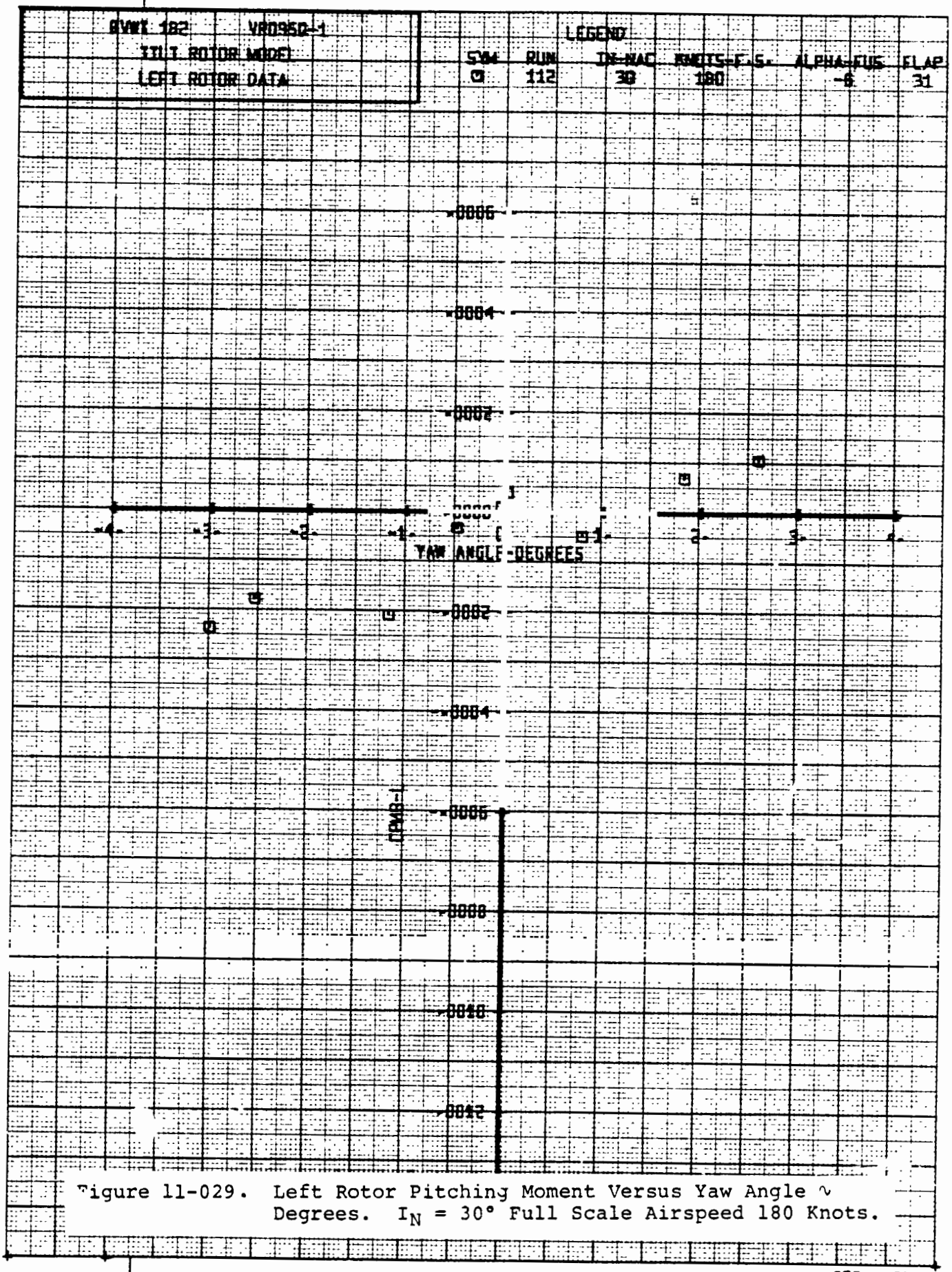


Figure 11-029. Left Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

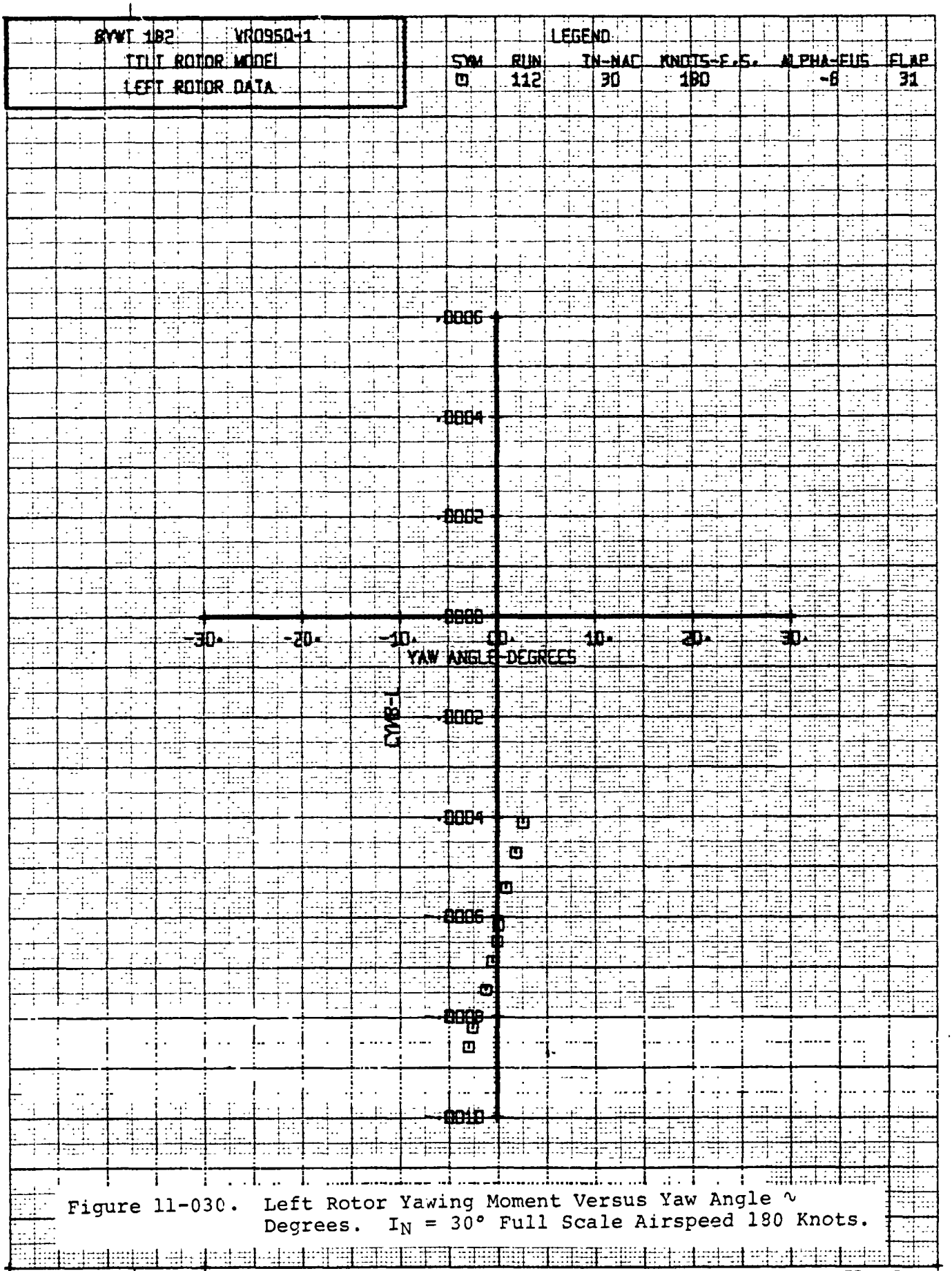


Figure 11-030. Left Rotor Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

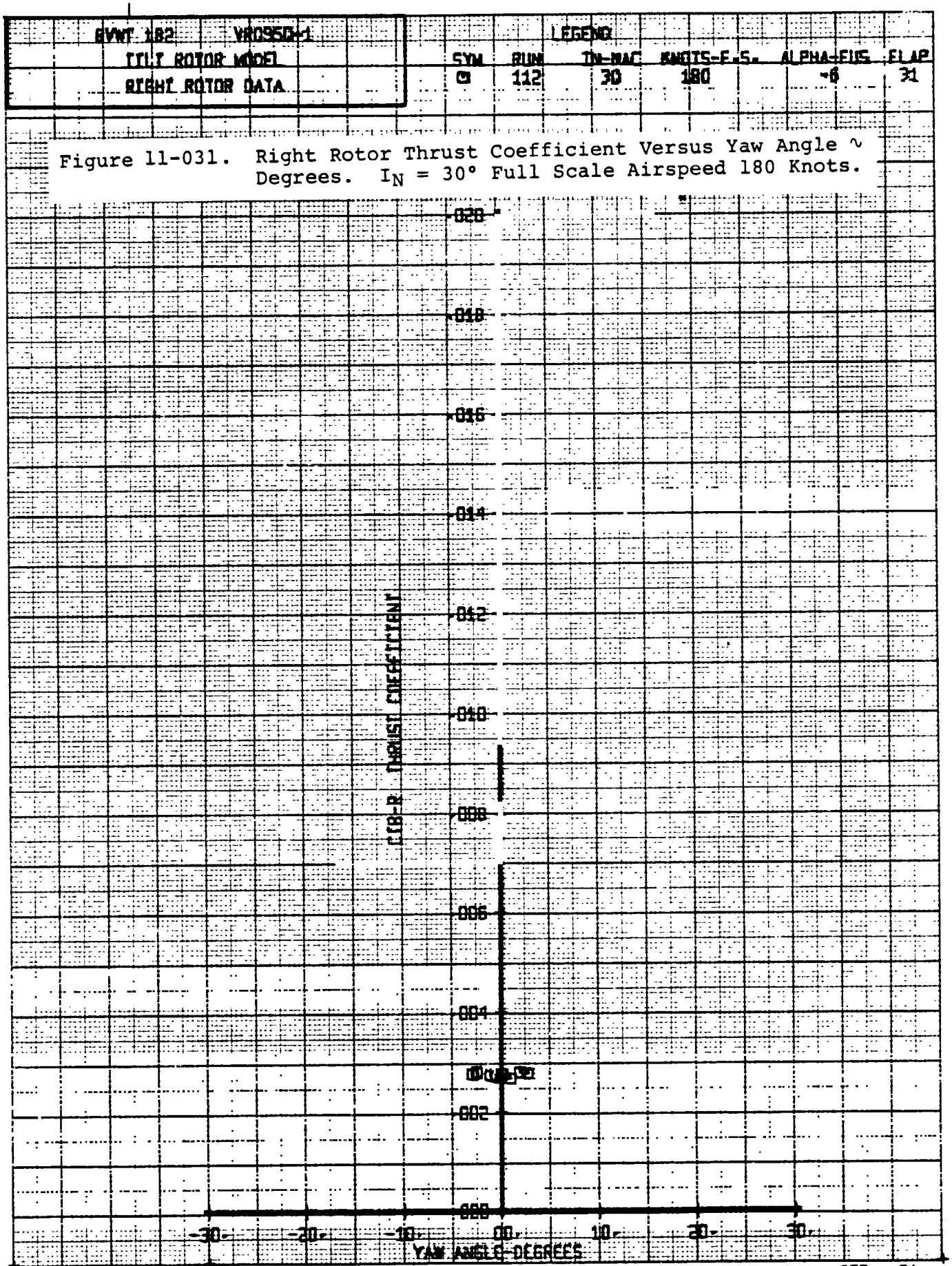


Figure 11-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

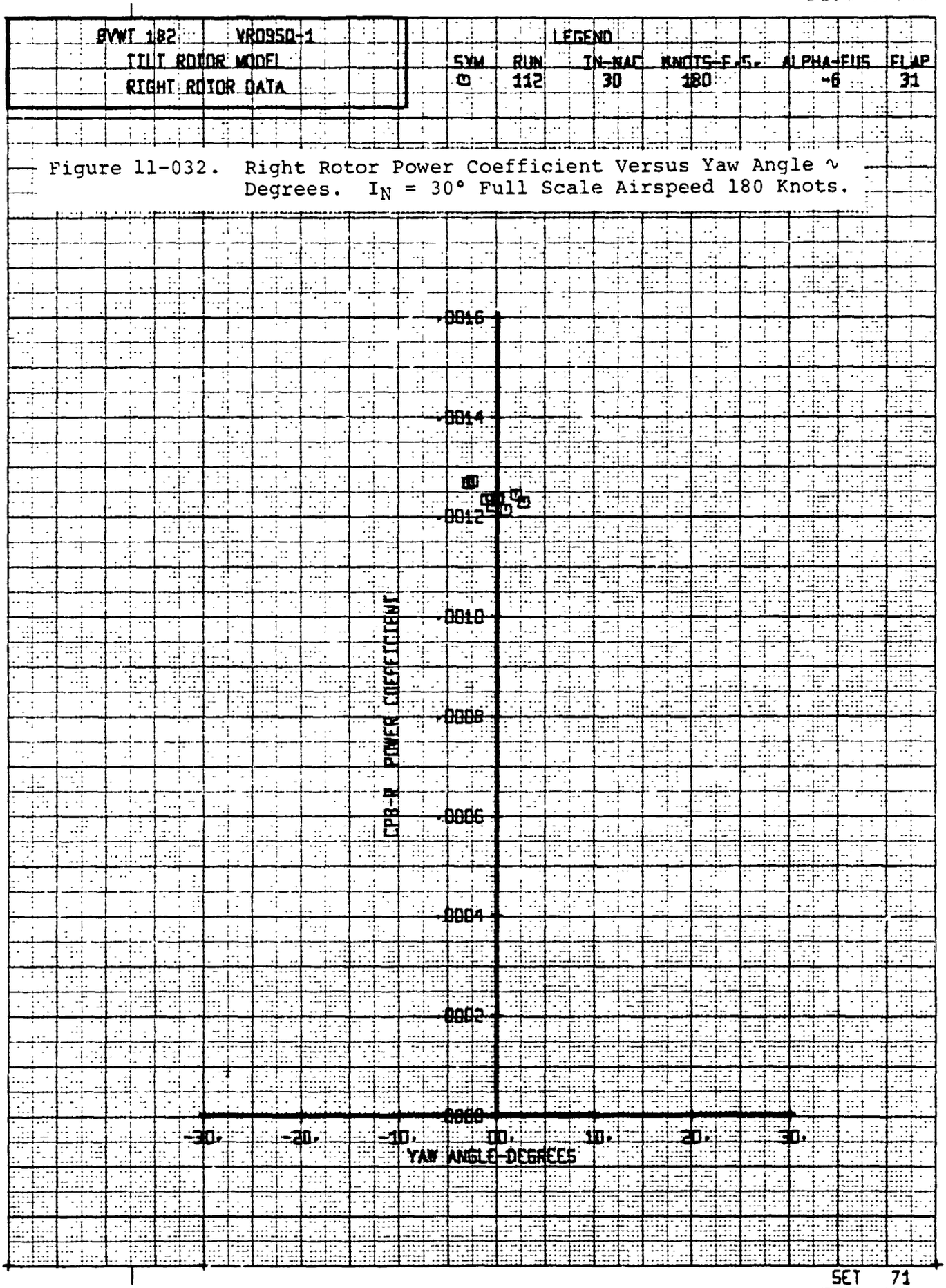


Figure 11-032. Right Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

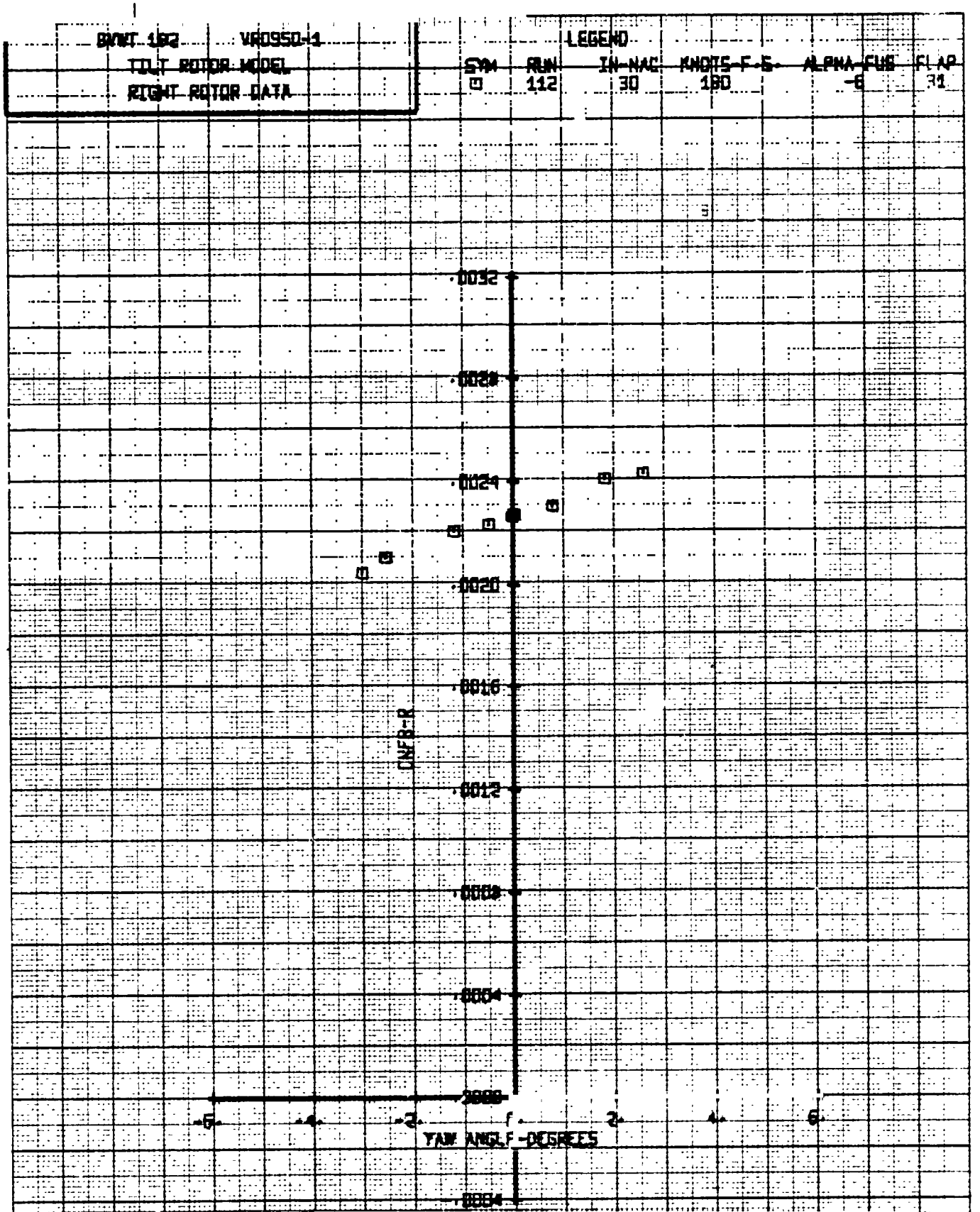


Figure 11-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

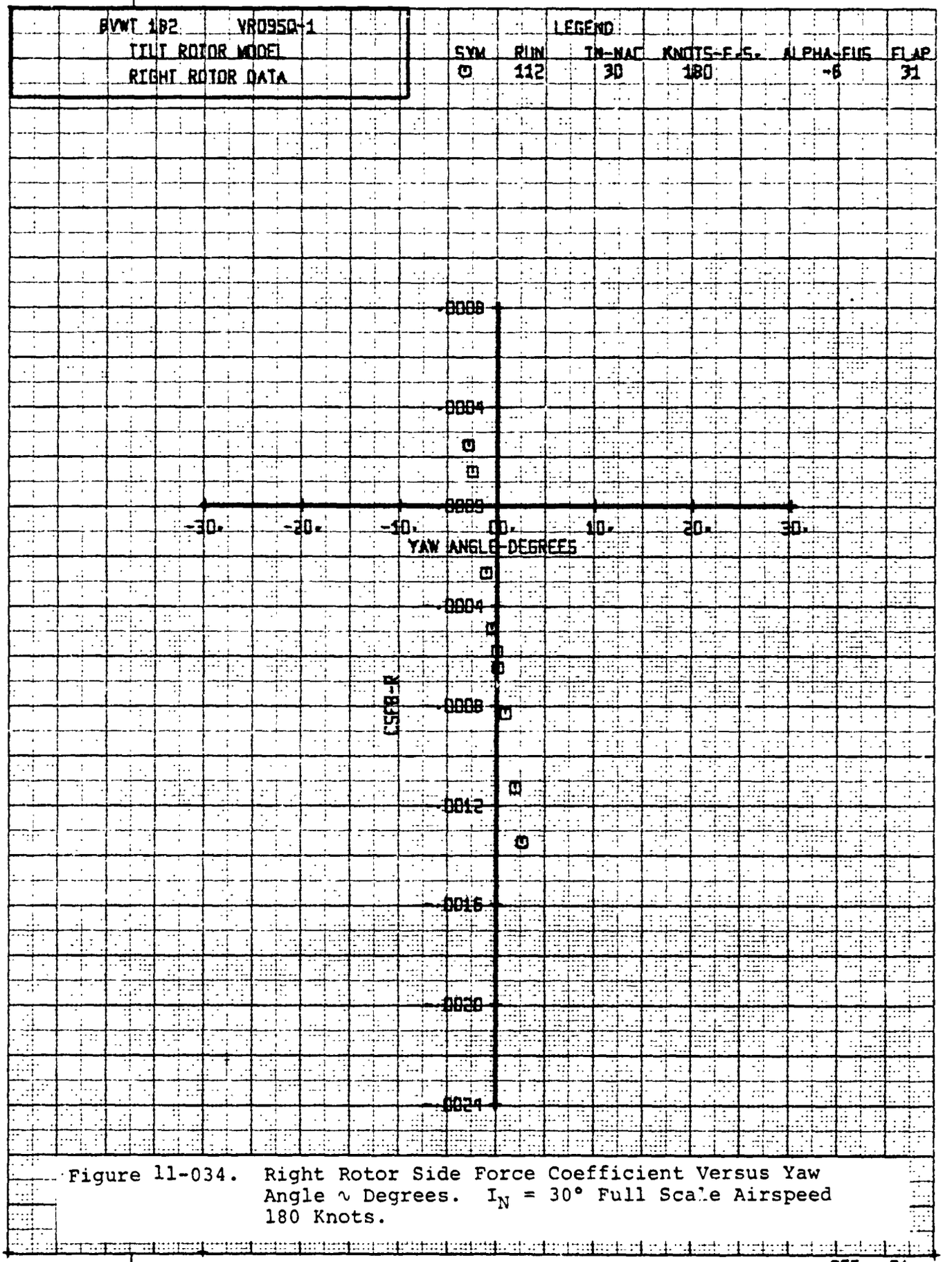


Figure 11-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

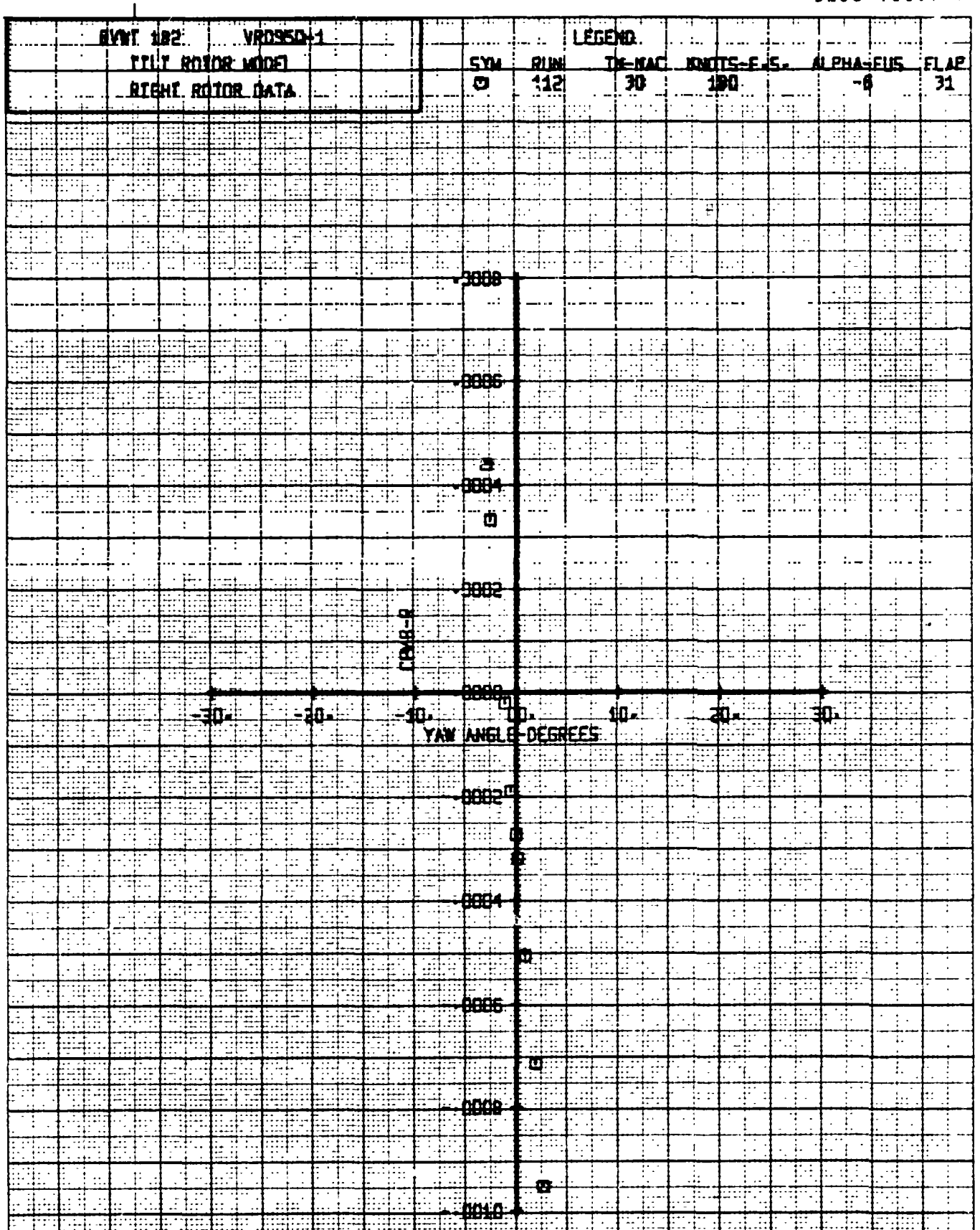


Figure 11-035. Right Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

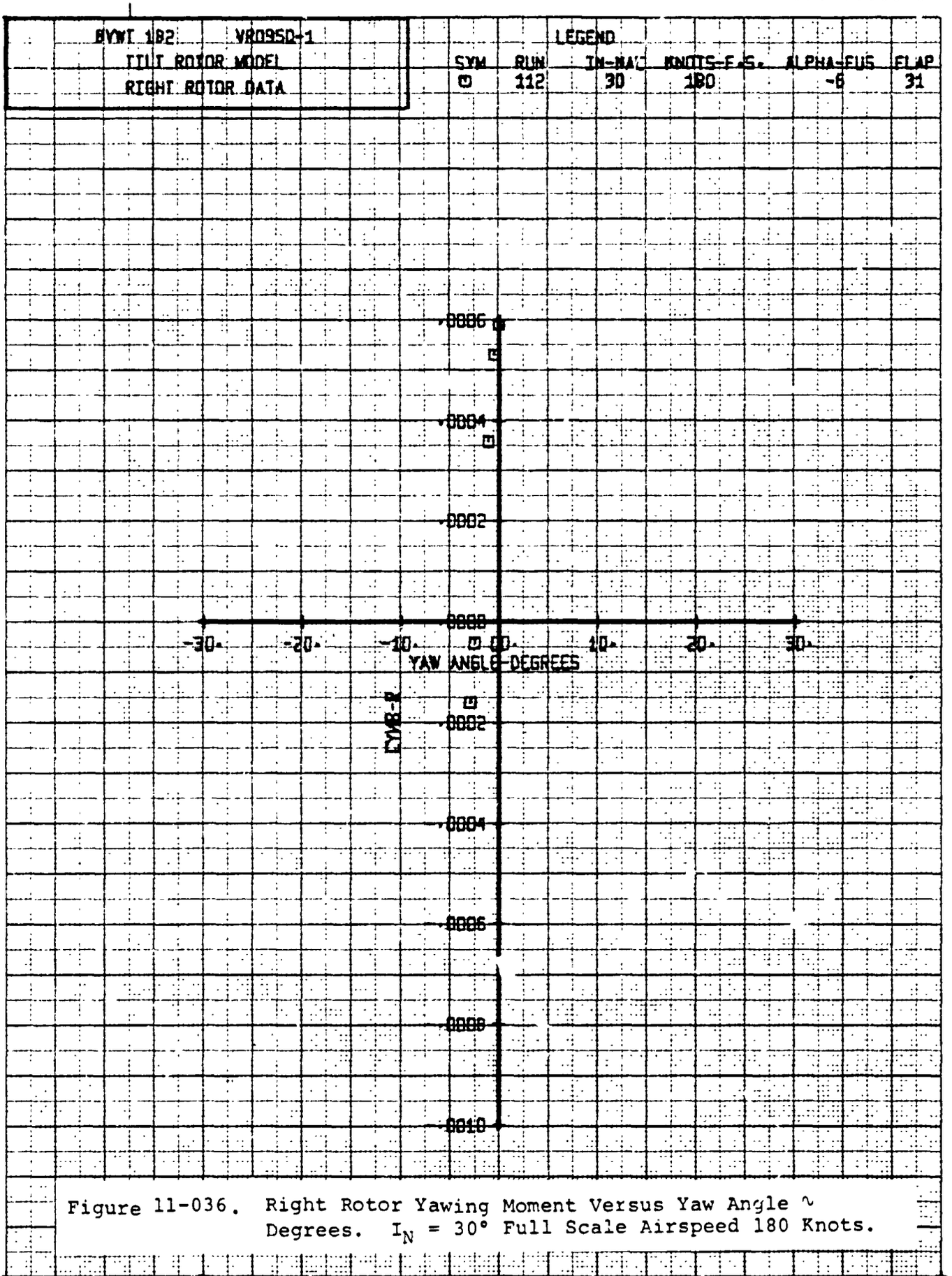


Figure 11-036. Right Rotor Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

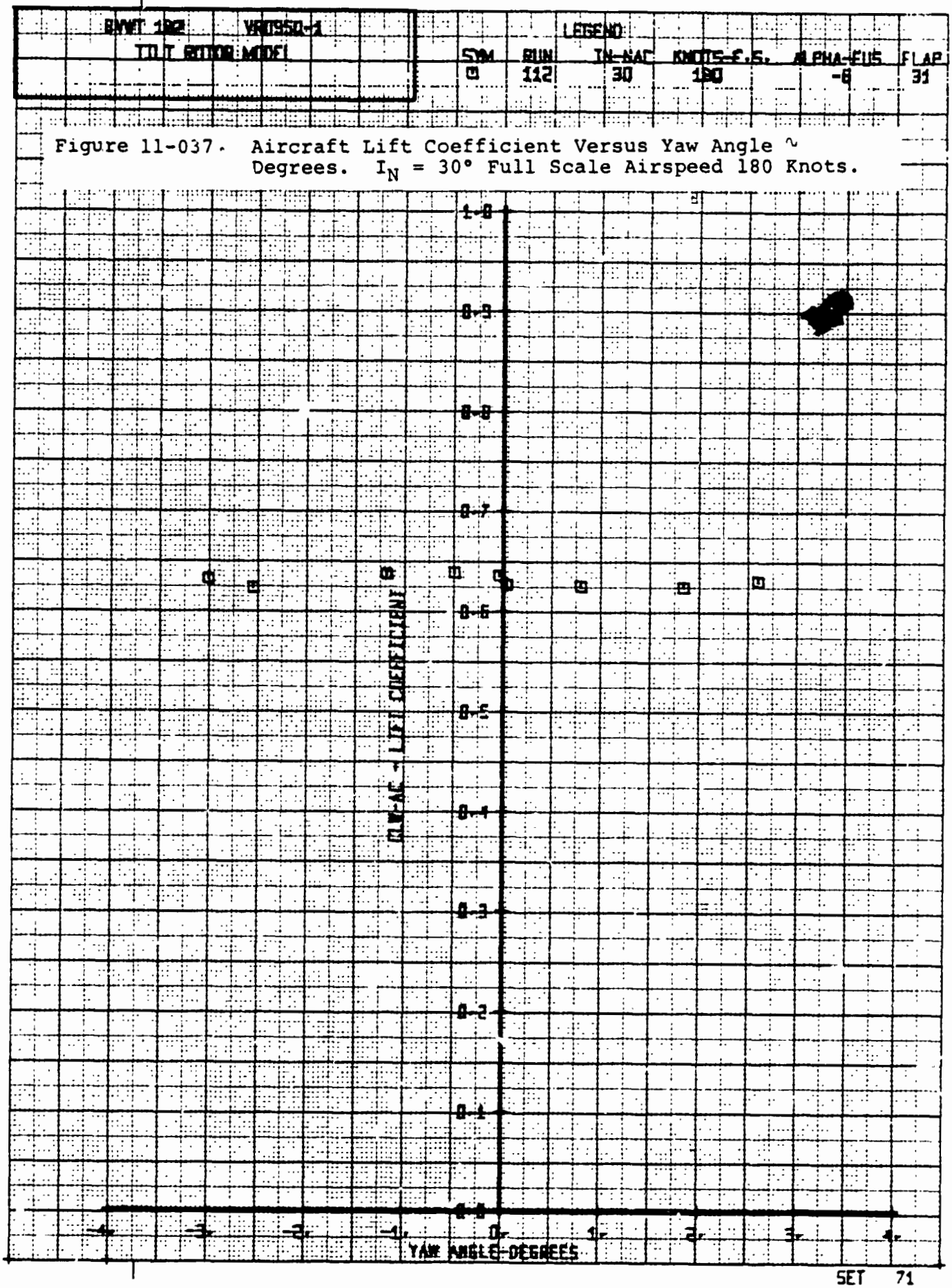


Figure 11-037. Aircraft Lift Coefficient Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

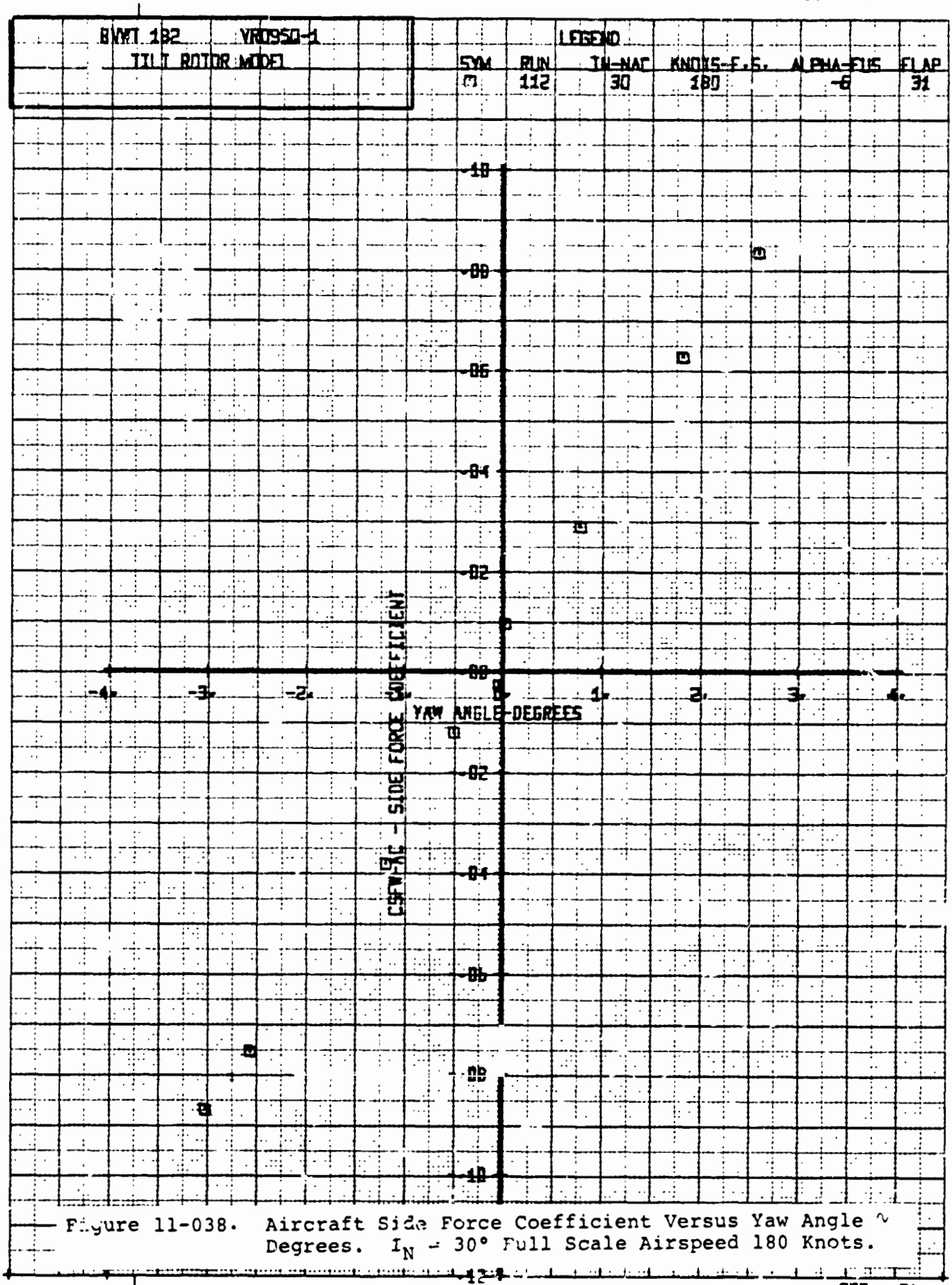


Figure 11-038. Aircraft Side Force Coefficient Versus Yaw Angle ~ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

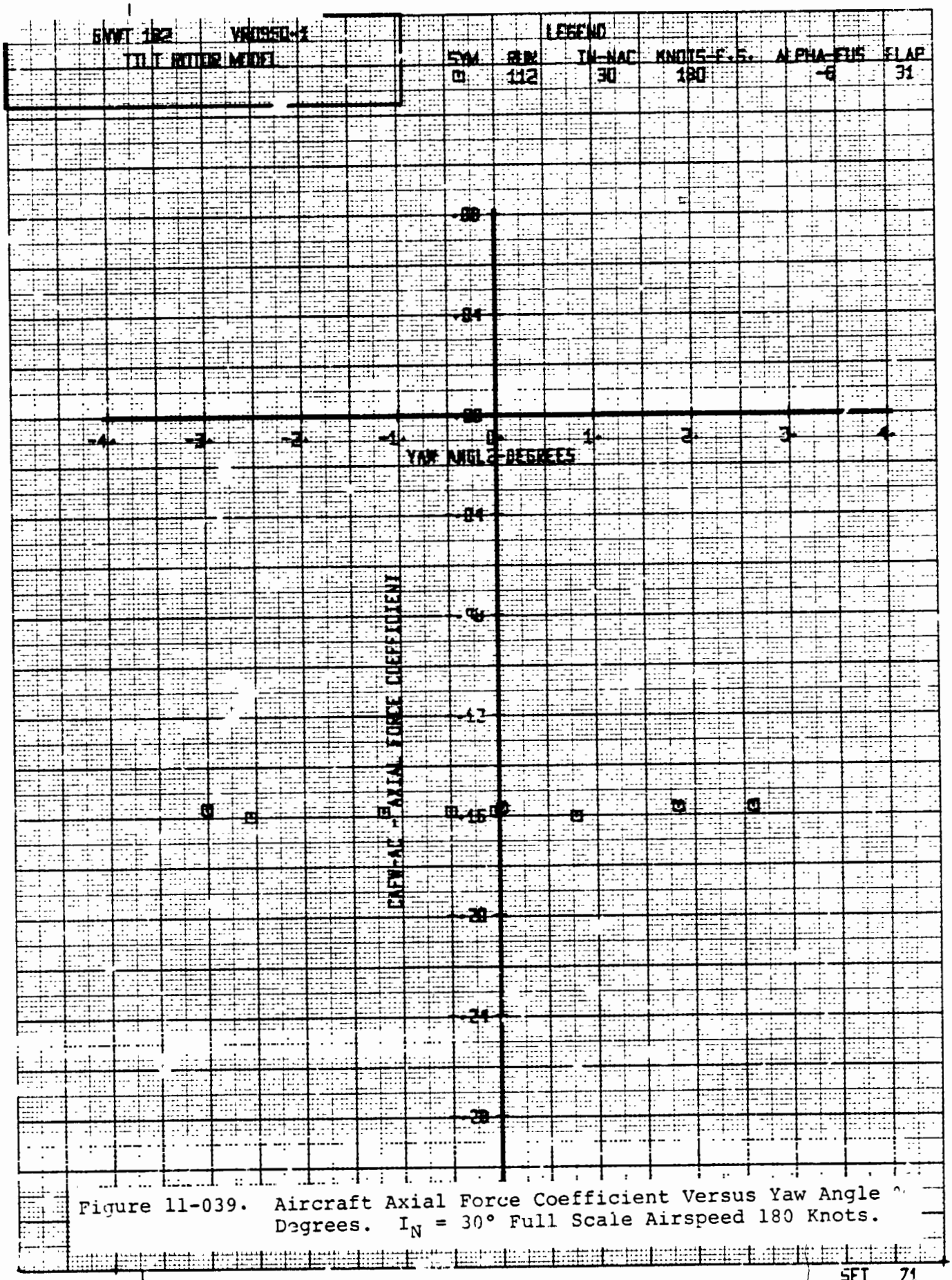


Figure 11-039. Aircraft Axial Force Coefficient Versus Yaw Angle Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

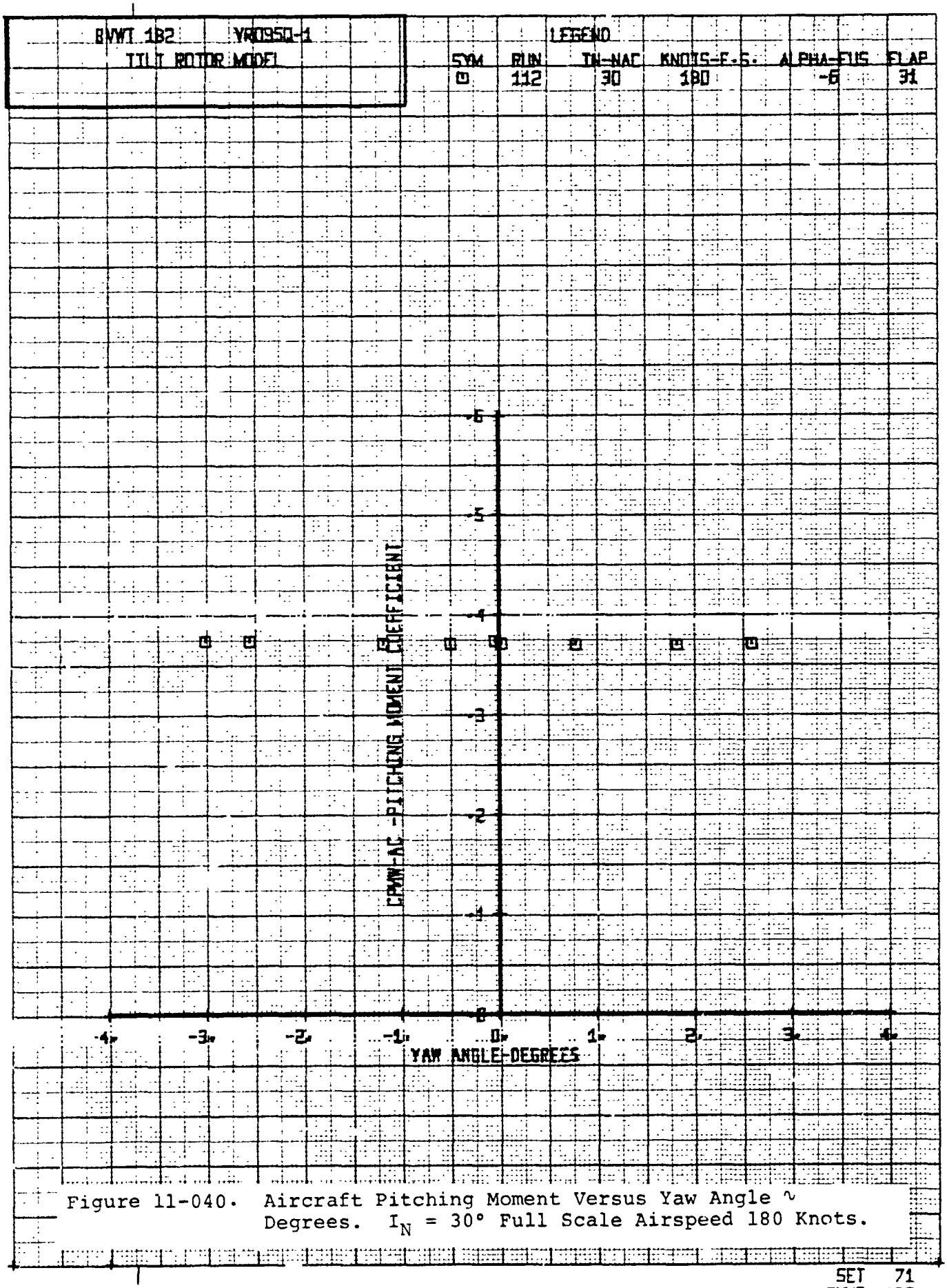


Figure 11-040. Aircraft Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

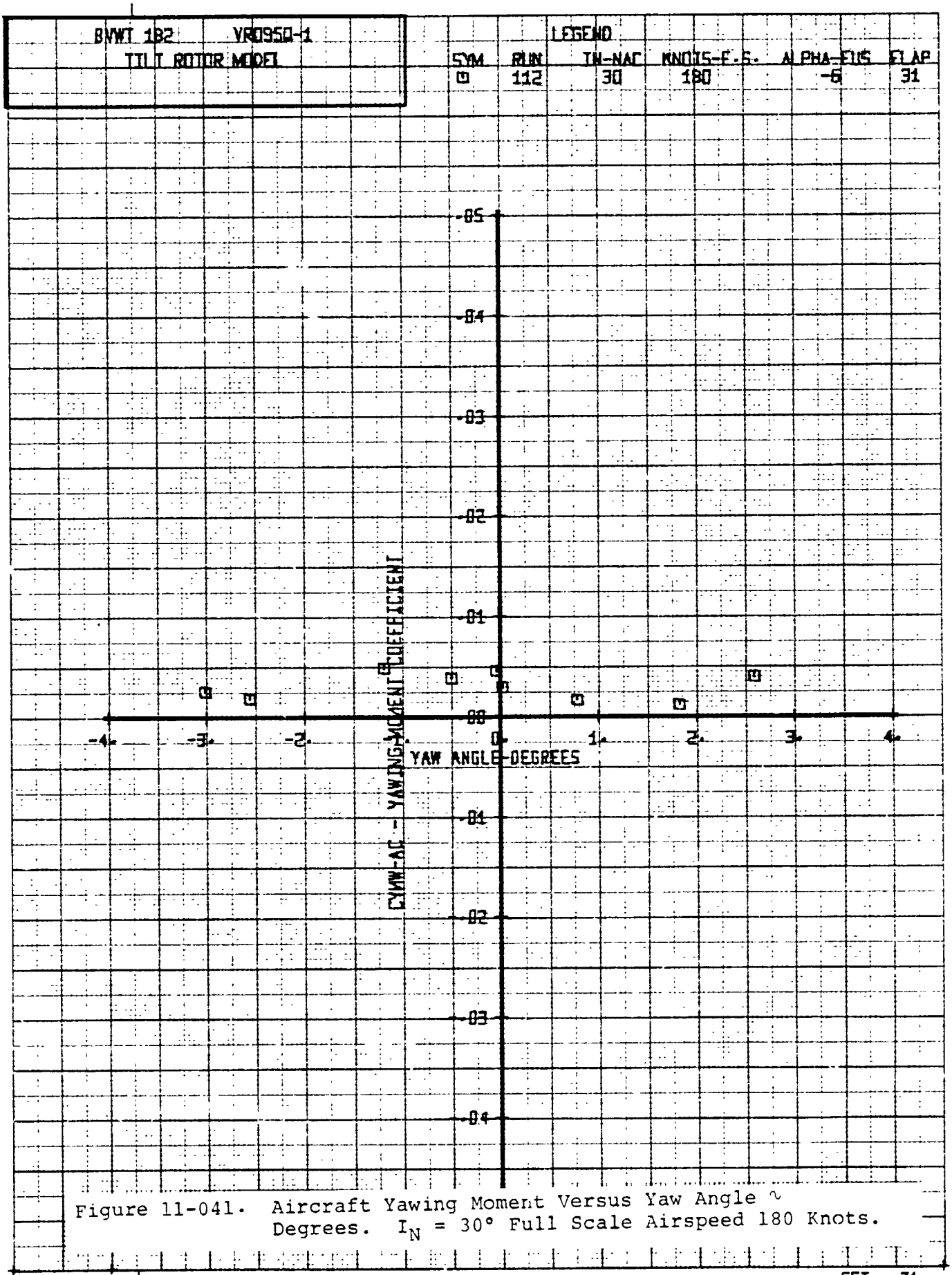


Figure 11-041. Aircraft Yawing Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

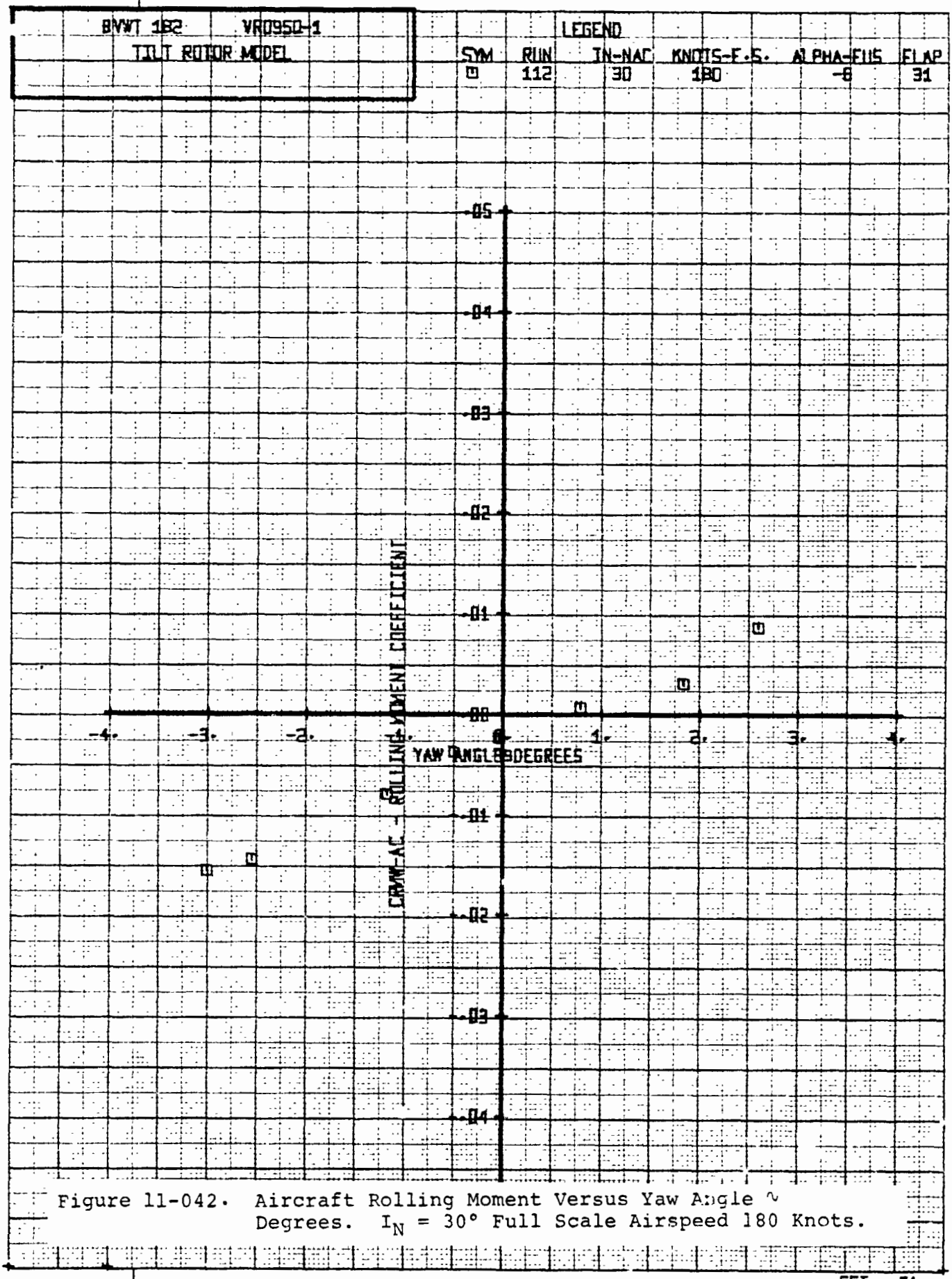


Figure 11-042. Aircraft Rolling Moment Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

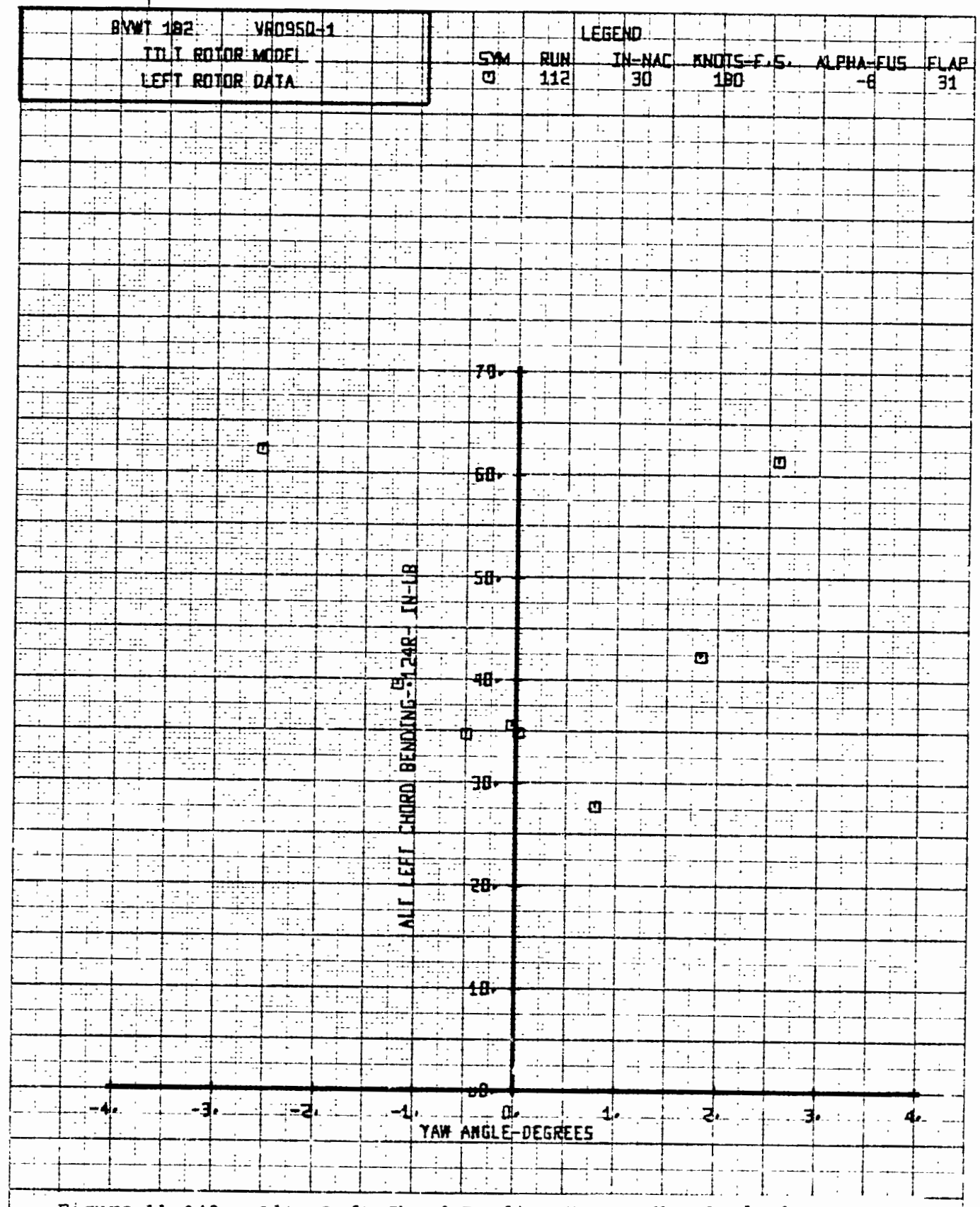


Figure 11-043. Alt. Left Chord Bending Versus Yaw Angle ~ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

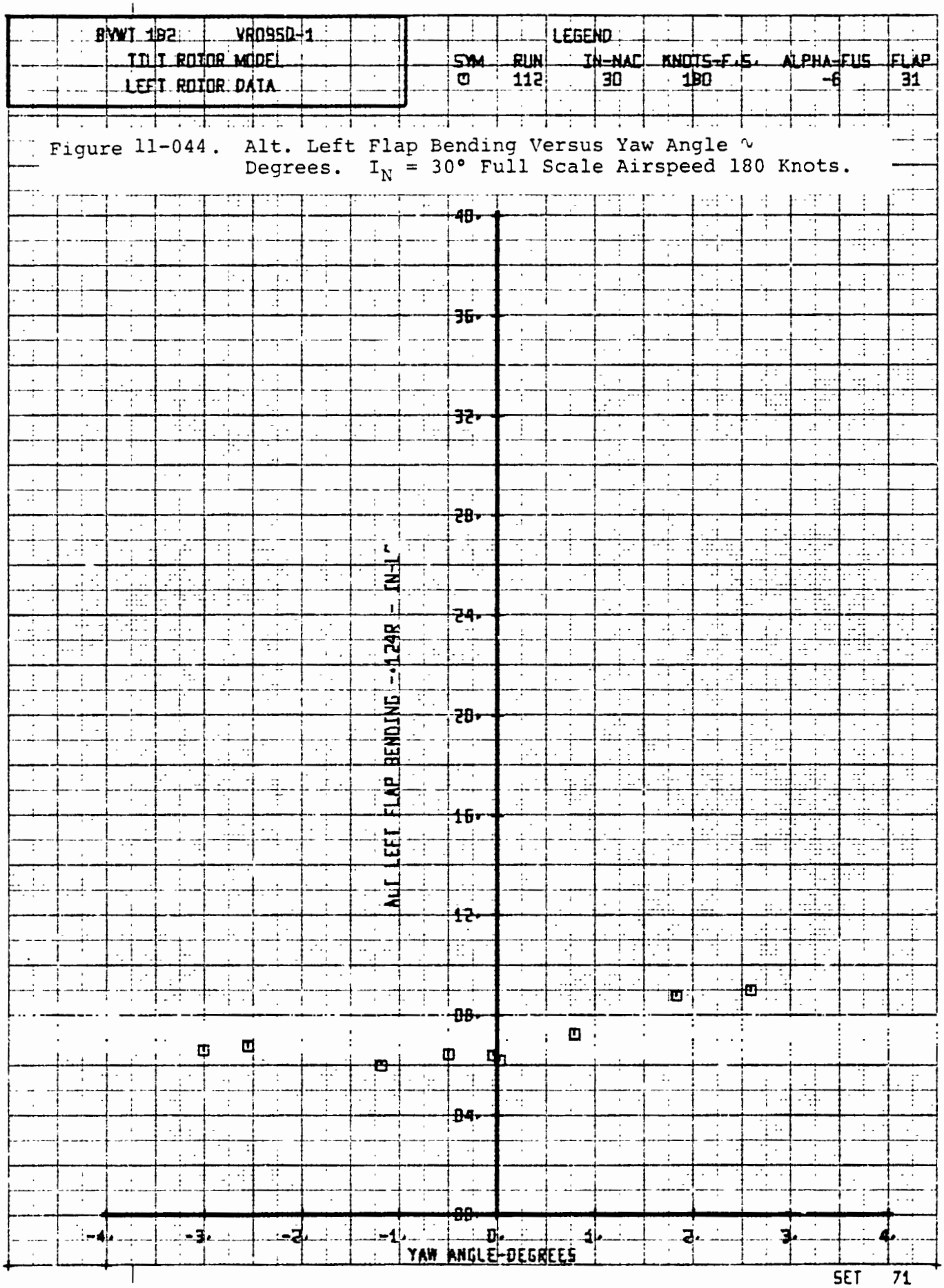
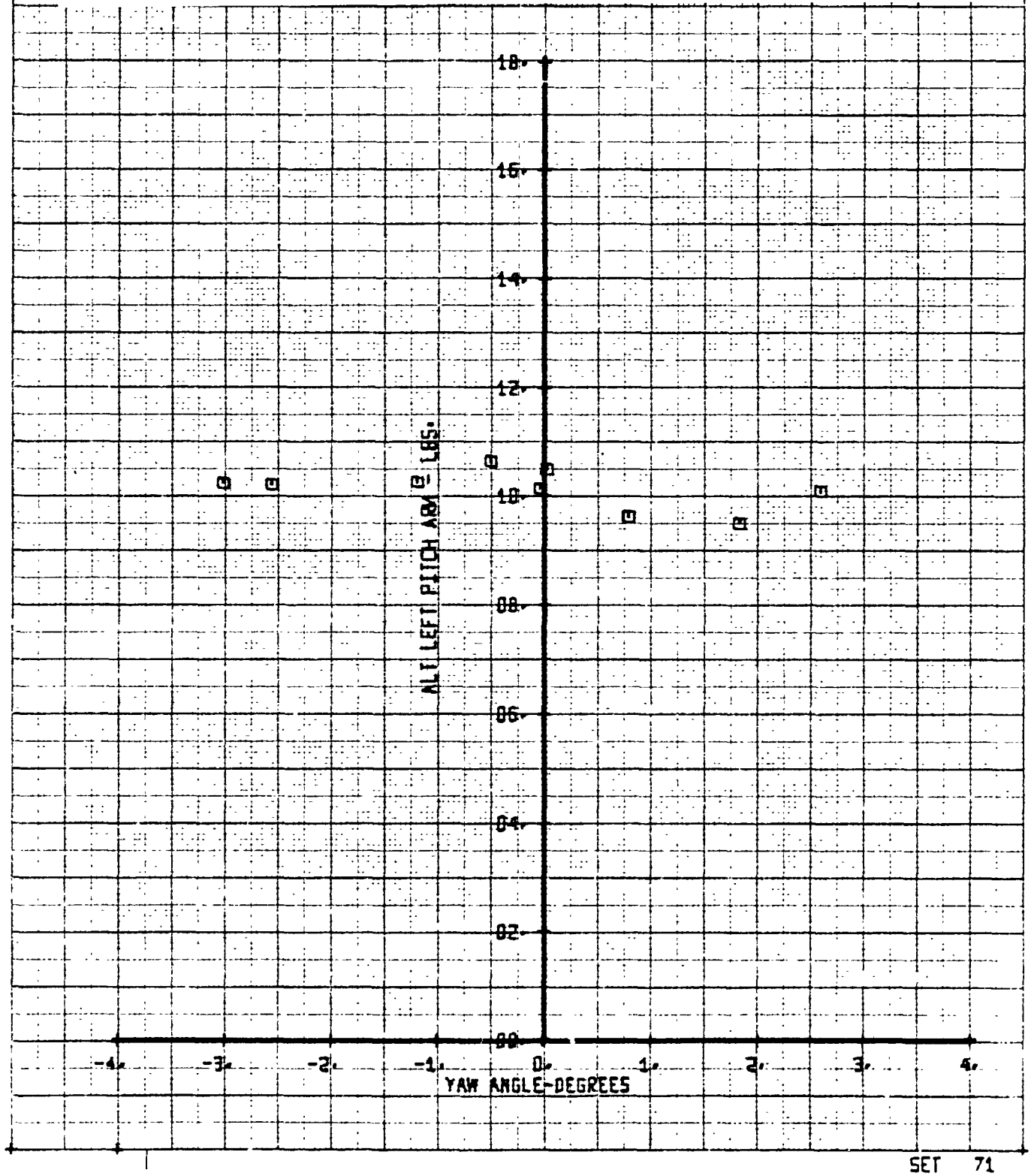


Figure 11-044. Alt. Left Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1 TILT ROTOR MODEL LEFT ROTOR DATA	LEGEND	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
	SYM					
	⊡	112	30	180	-6	31

Figure 11-045. Alt. Left Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



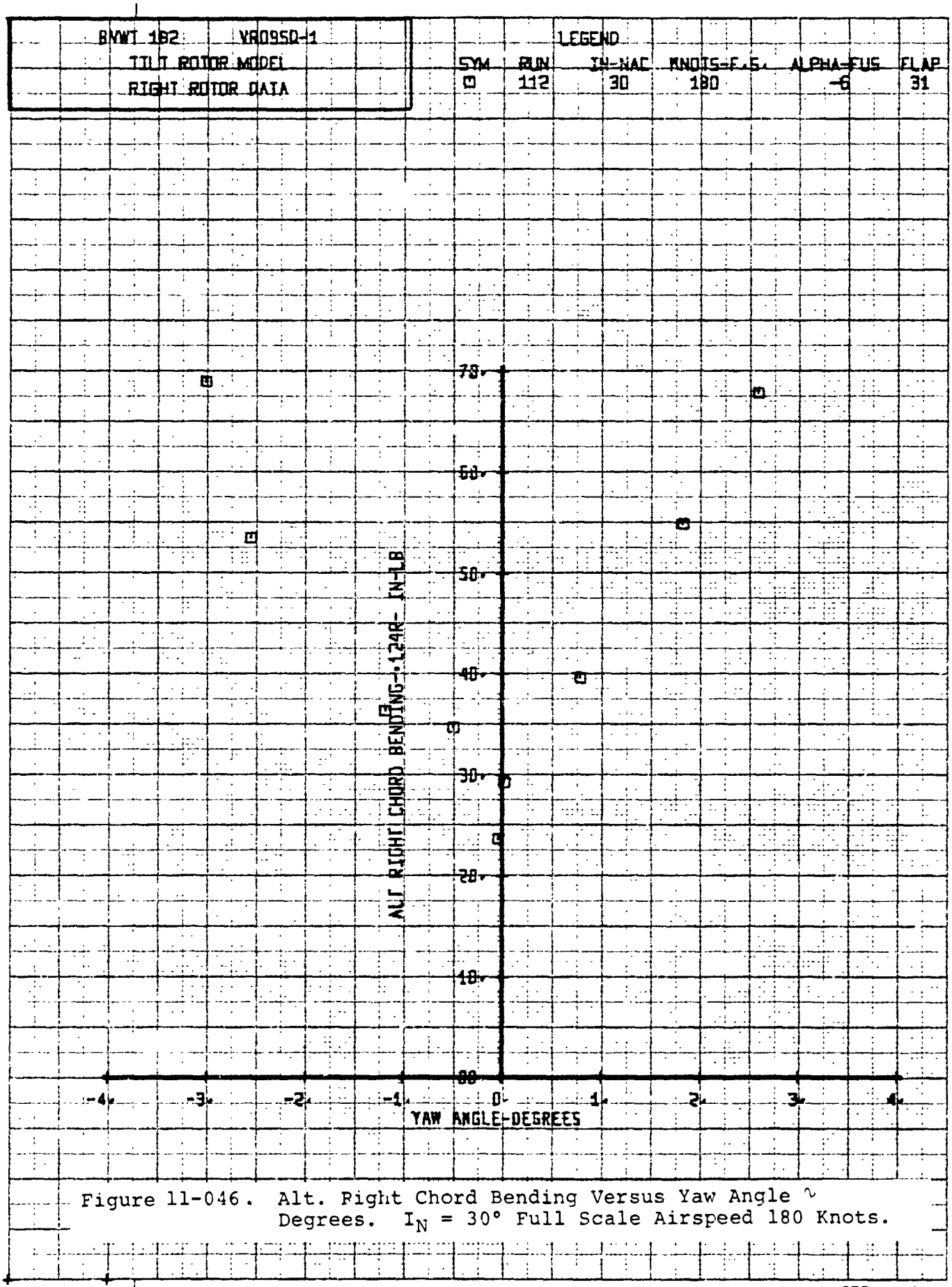


Figure 11-046. Alt. Right Chord Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

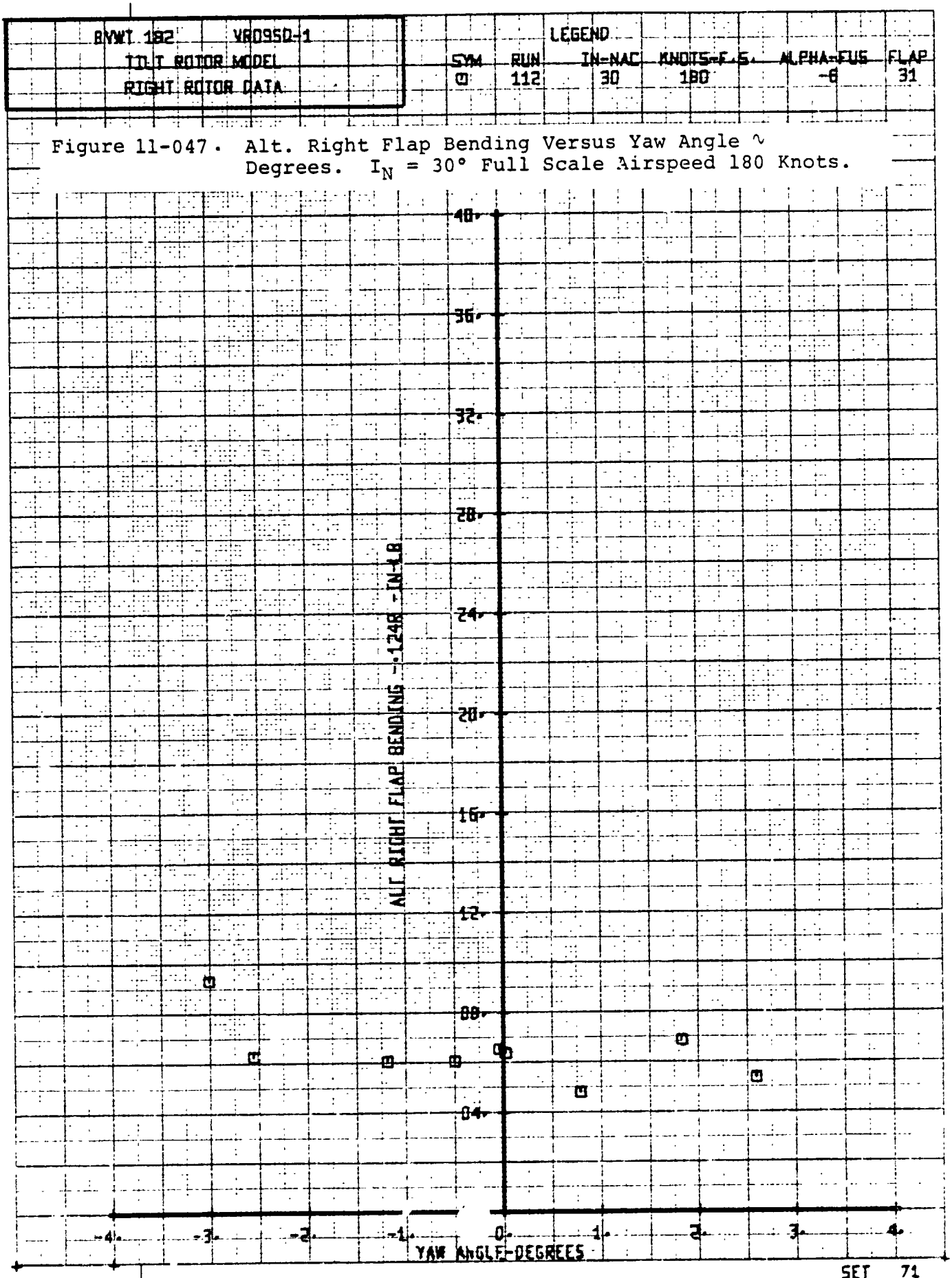


Figure 11-047. Alt. Right Flap Bending Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

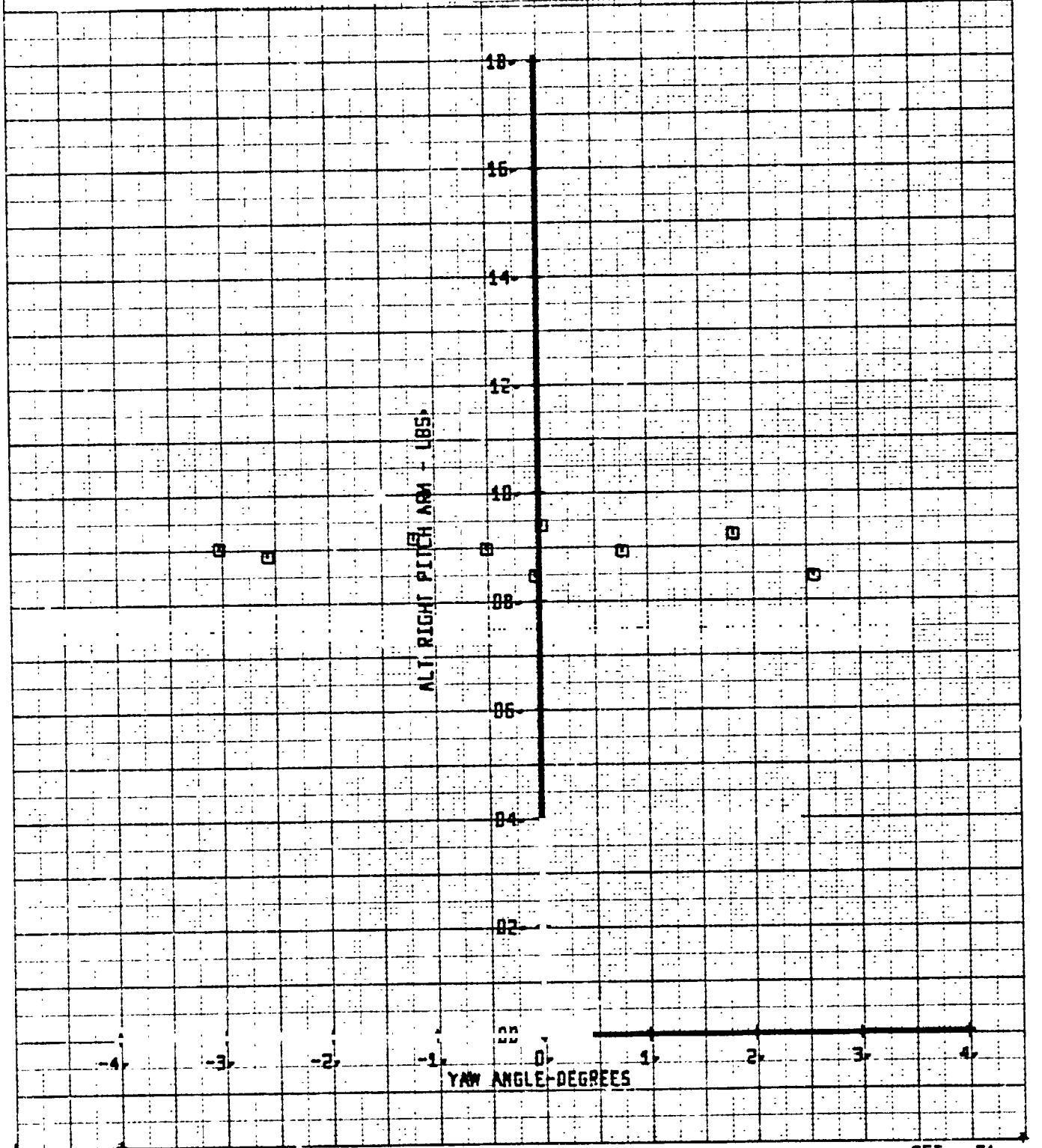
ET 71
W 182

SET 71
BVWT 182

BVWT 182 VRD950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	112	30	180	-6	31

Figure 11-048. Alt. Right Pitch Link Load Versus Yaw Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



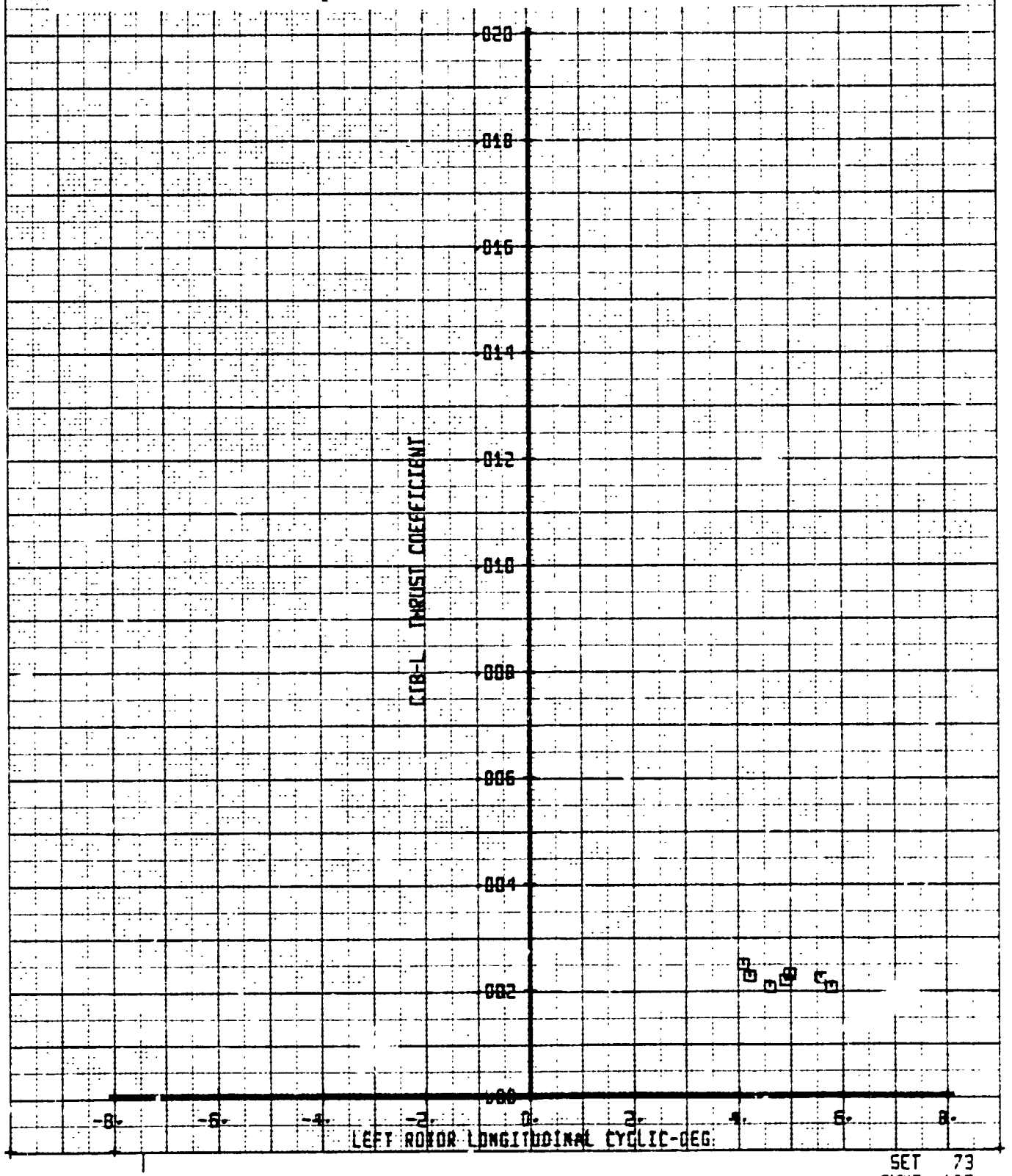
71
182

SET 71
BVWT 182

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	114	30	180	-6	31

Figure 11-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



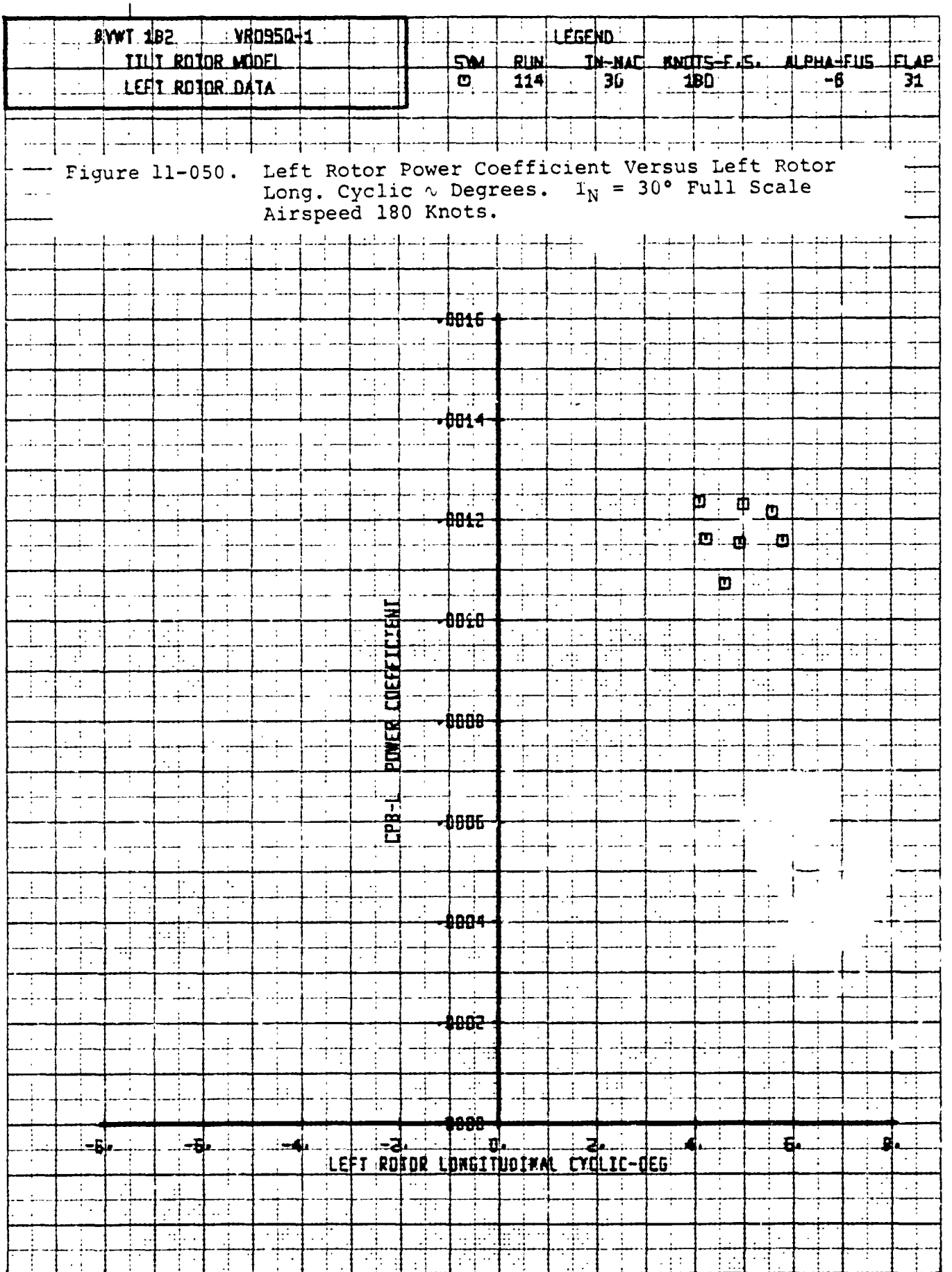


Figure 11-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

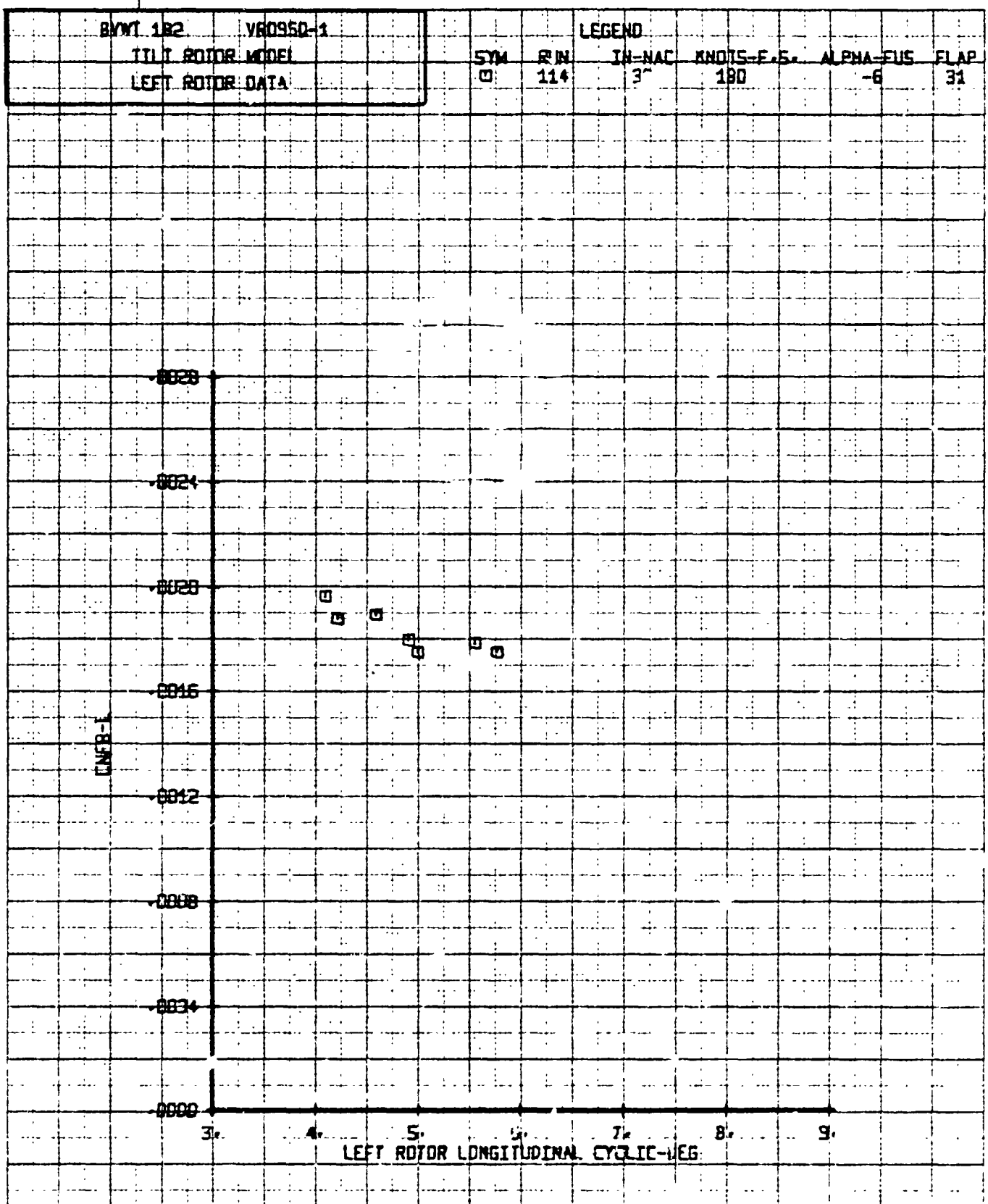


Figure 11-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Ful Scale Airspeed 180 Knots.

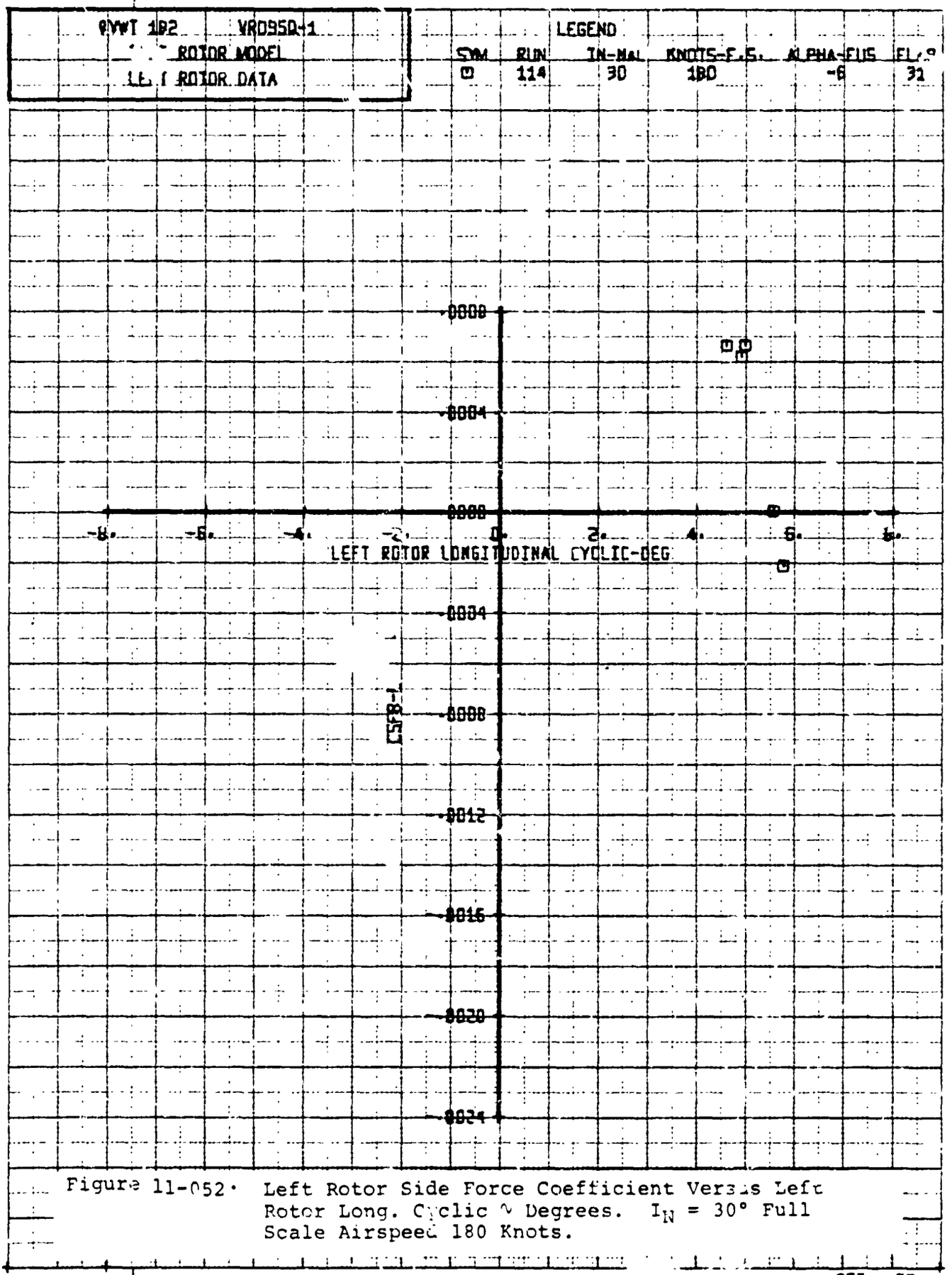


Figure 11-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

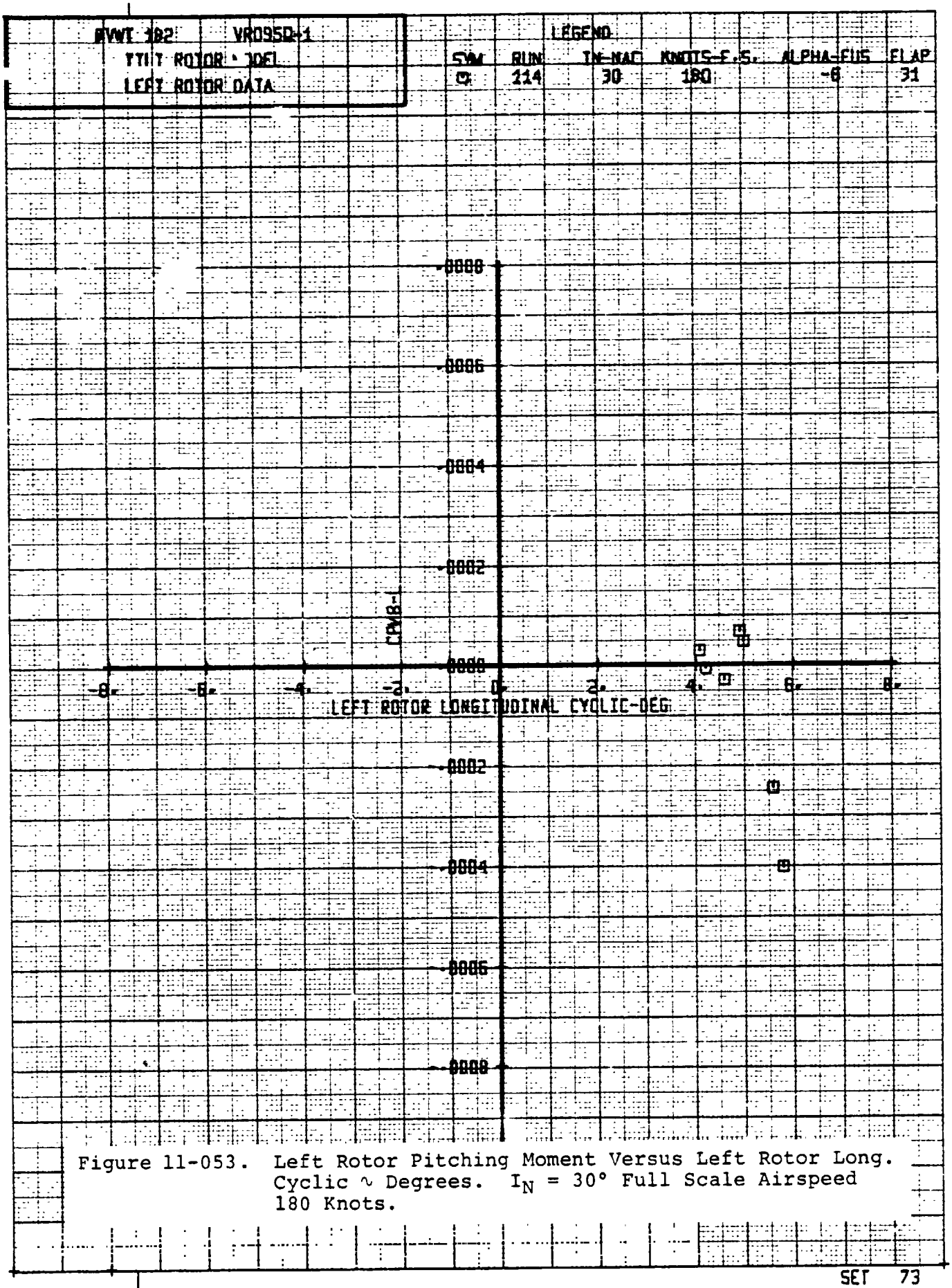


Figure 11-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

ET 73
182

SET 73
BVWT 182

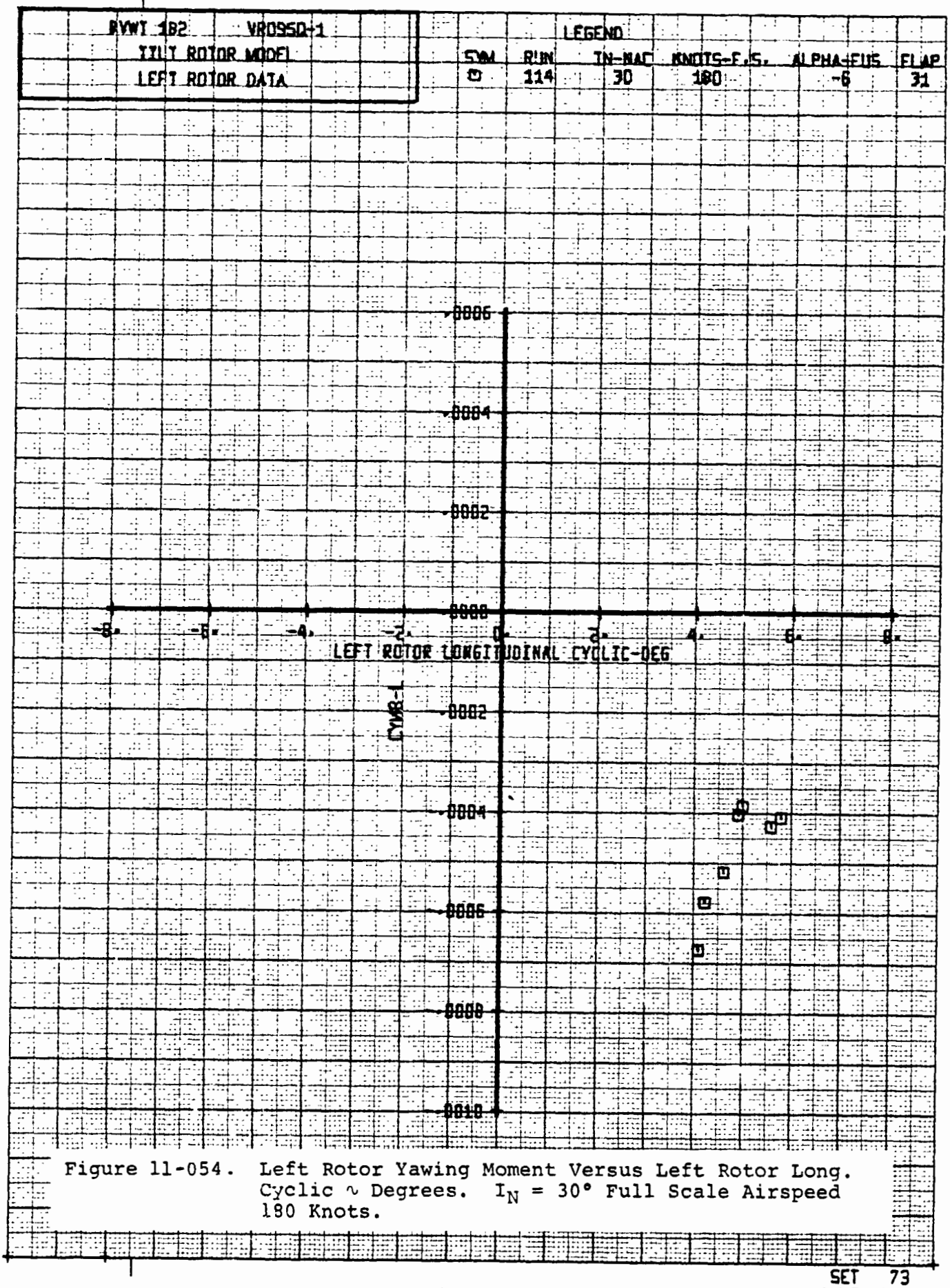


Figure 11-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

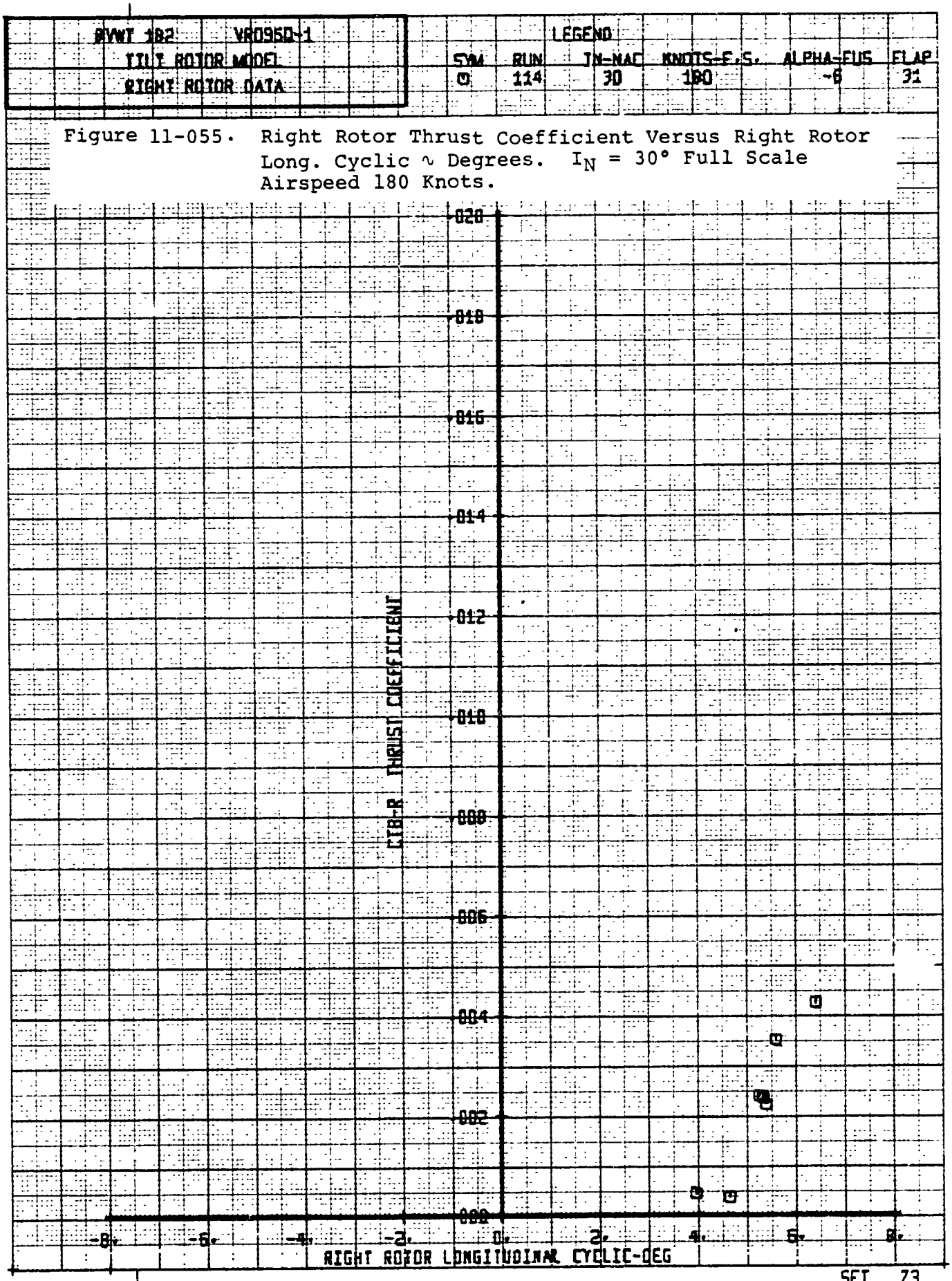


Figure 11-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

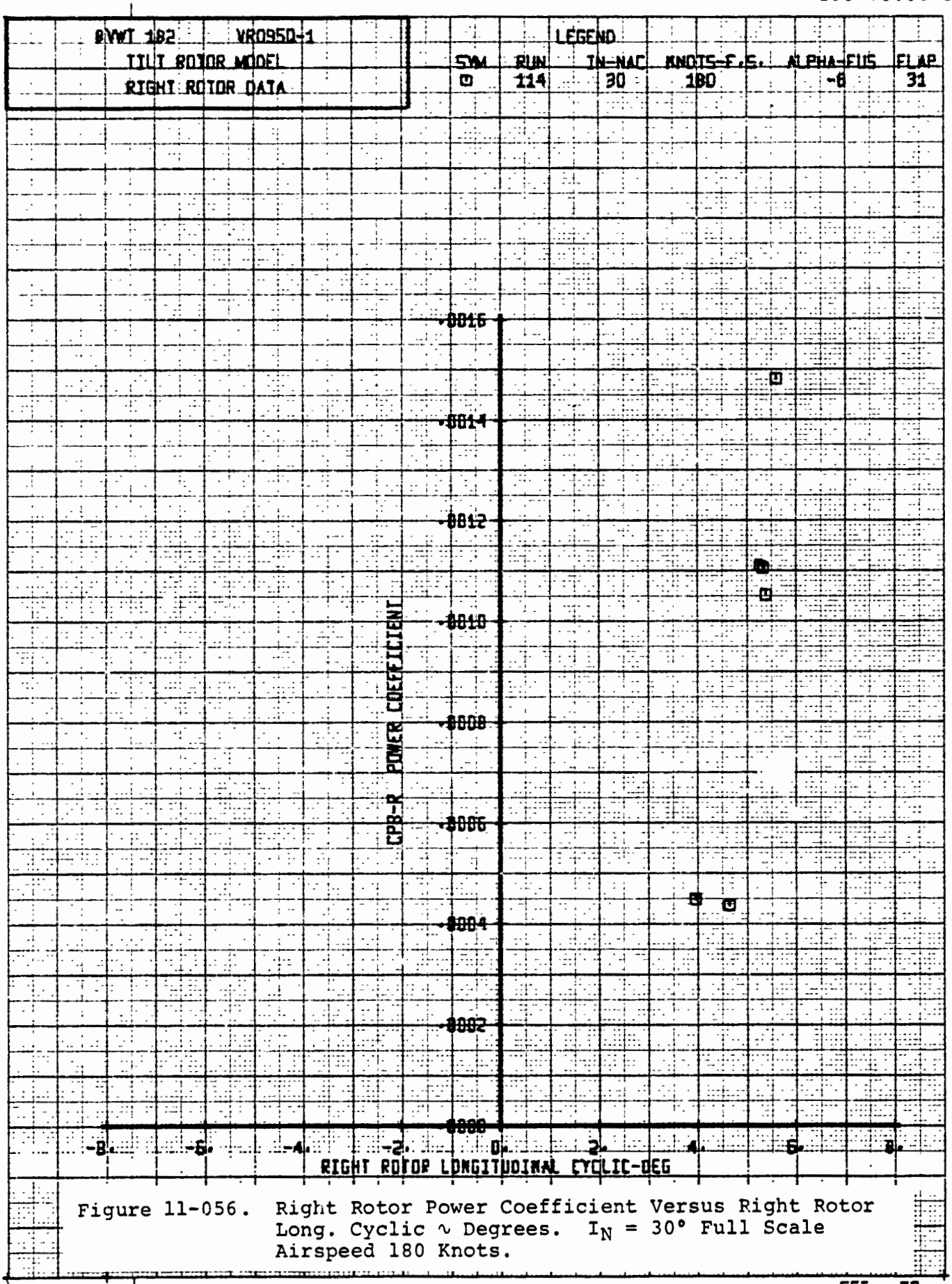


Figure 11-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

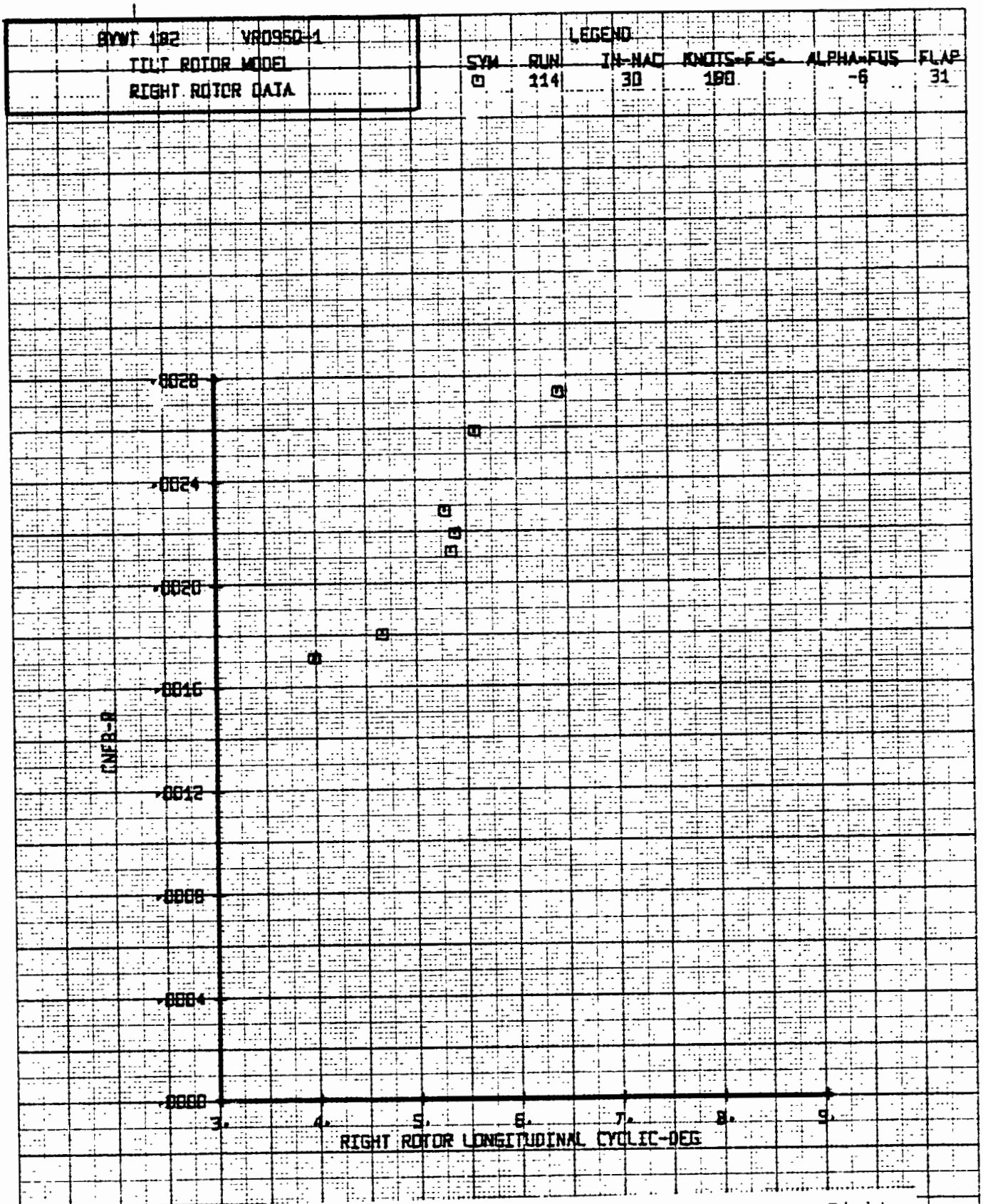


Figure 11-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

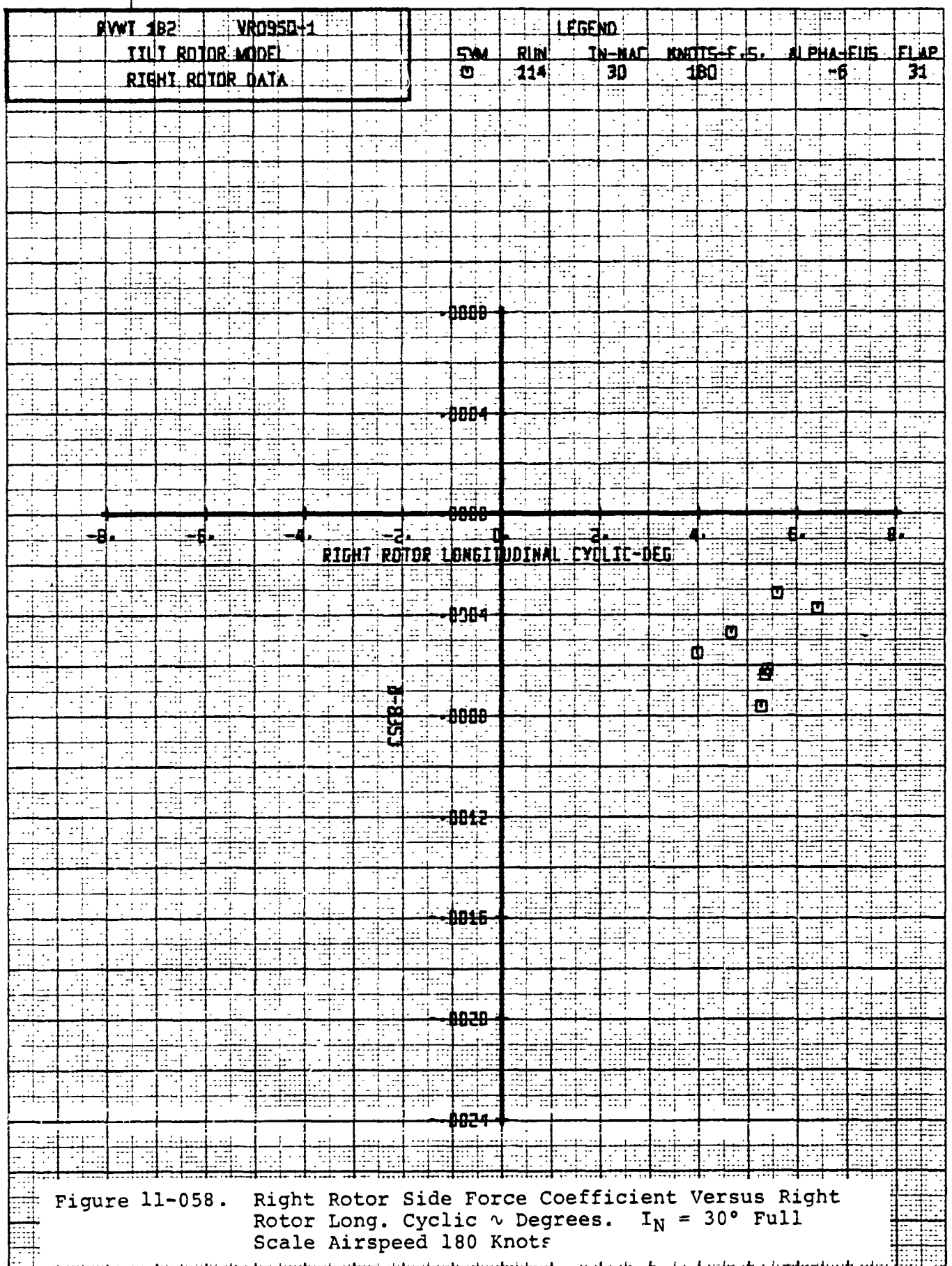


Figure 11-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots

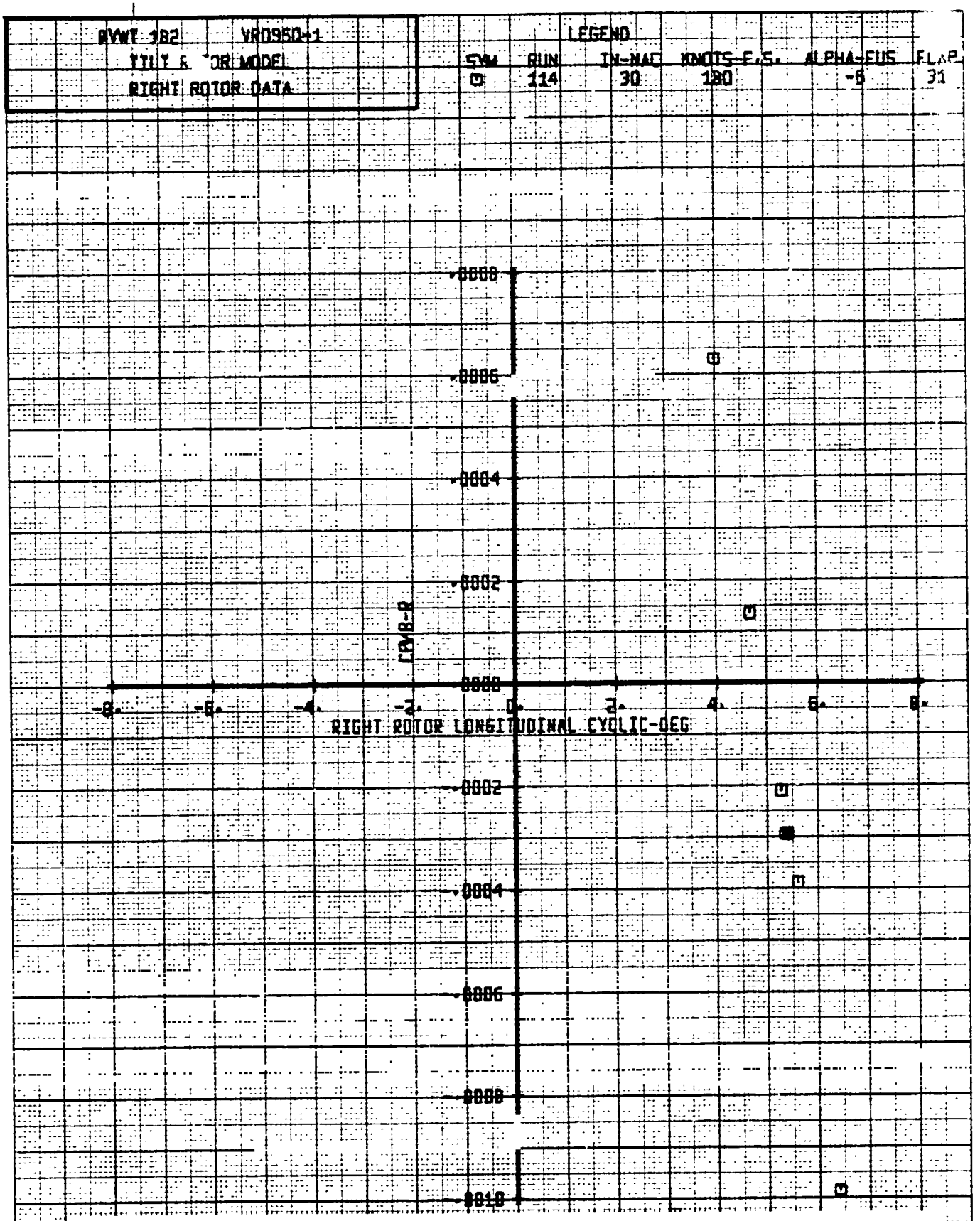


Figure 11-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

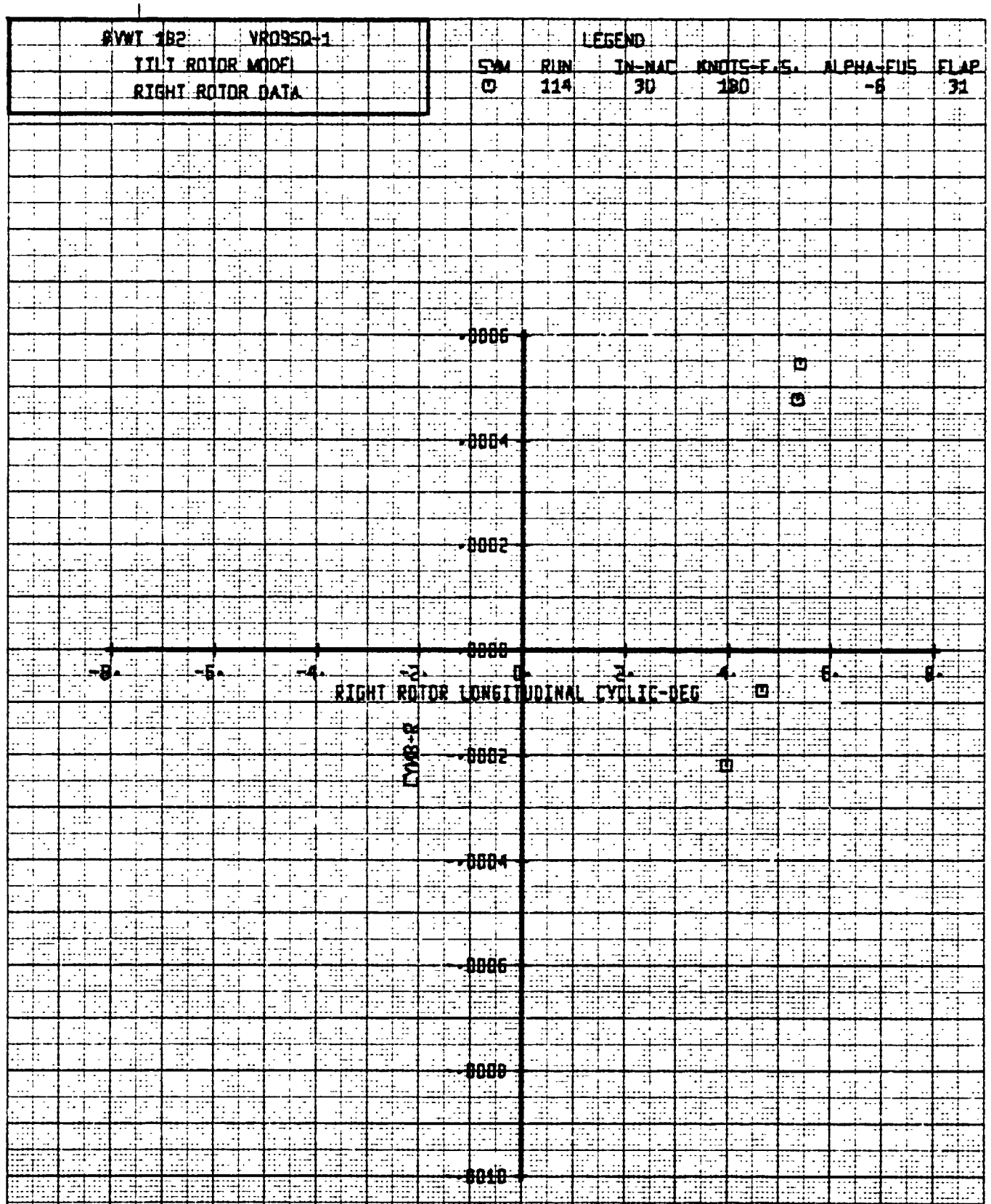
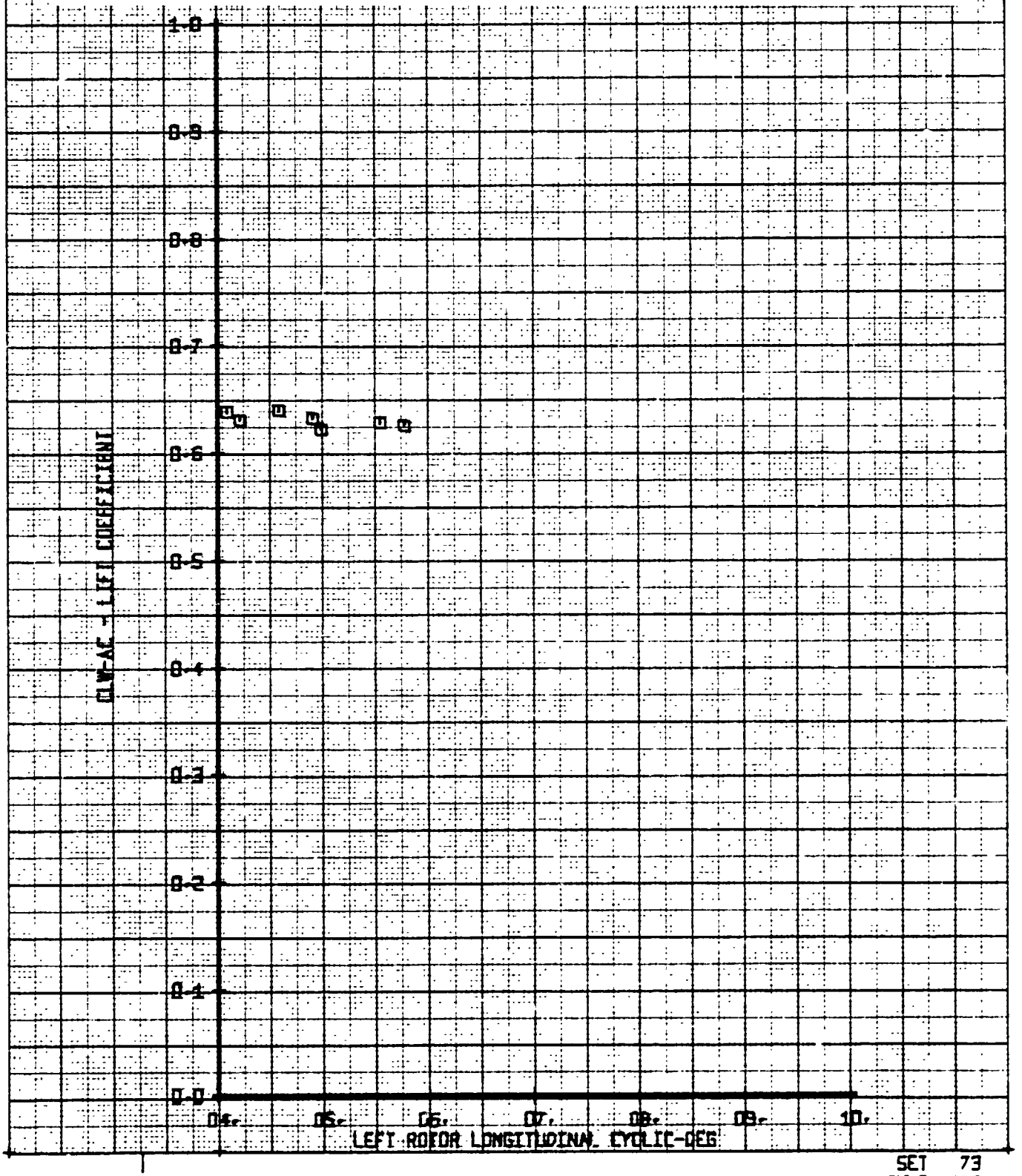


Figure 11-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL

LEGEND					
SYM	RUN	TN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	114	30	180	-6	31

Figure 11-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



ET 73
182

SET 73
BVWT 182

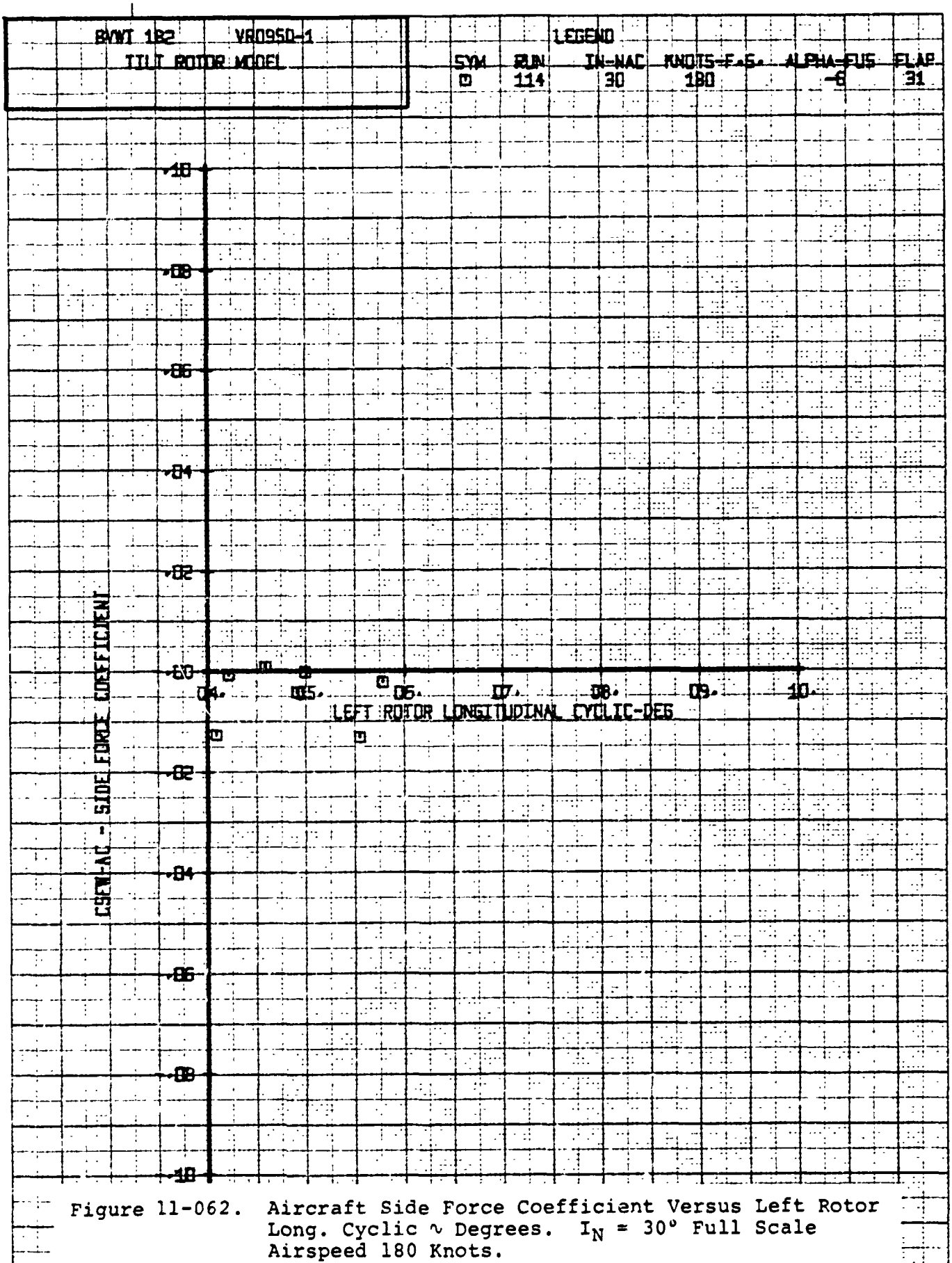


Figure 11-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

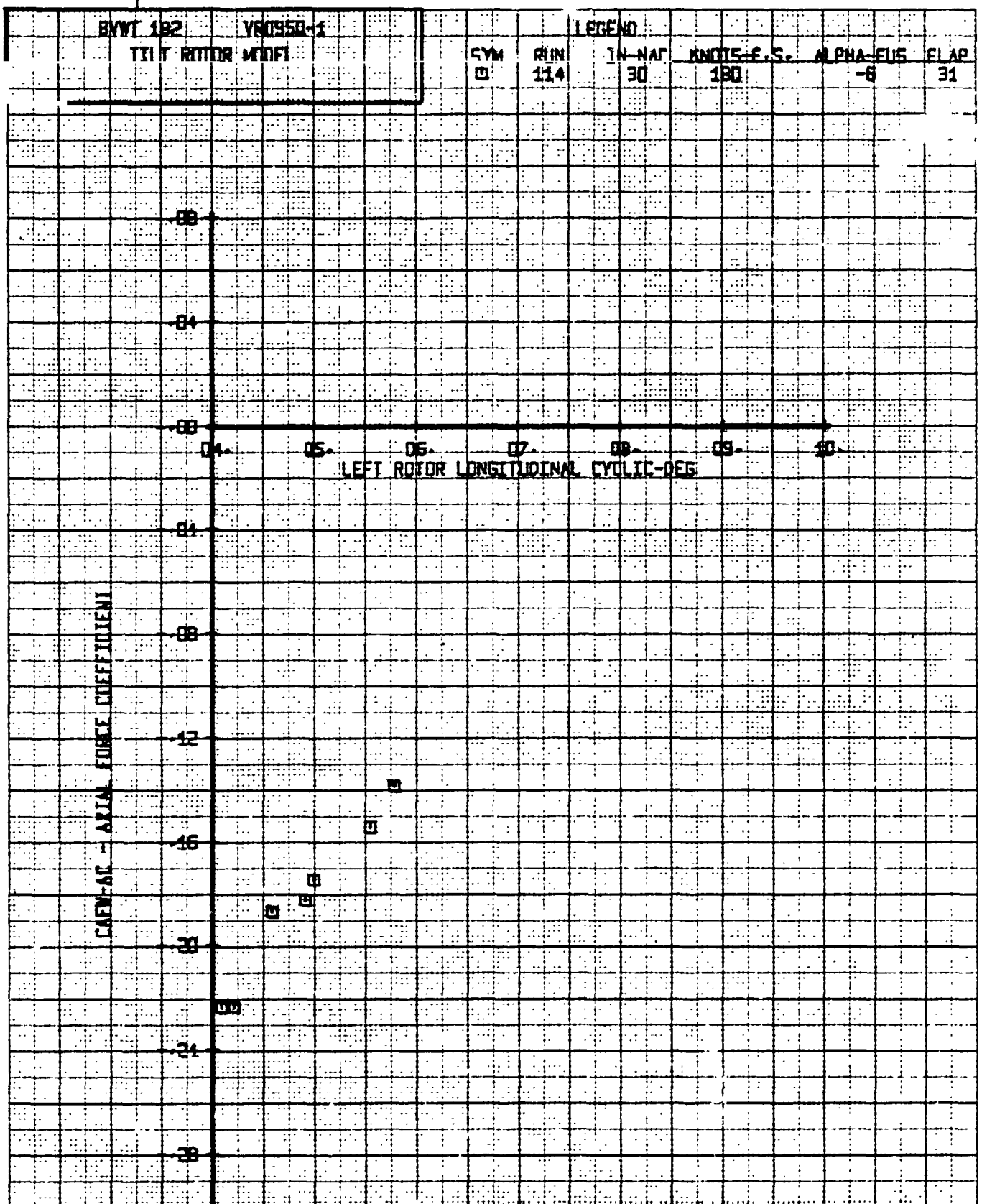


Figure 11-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

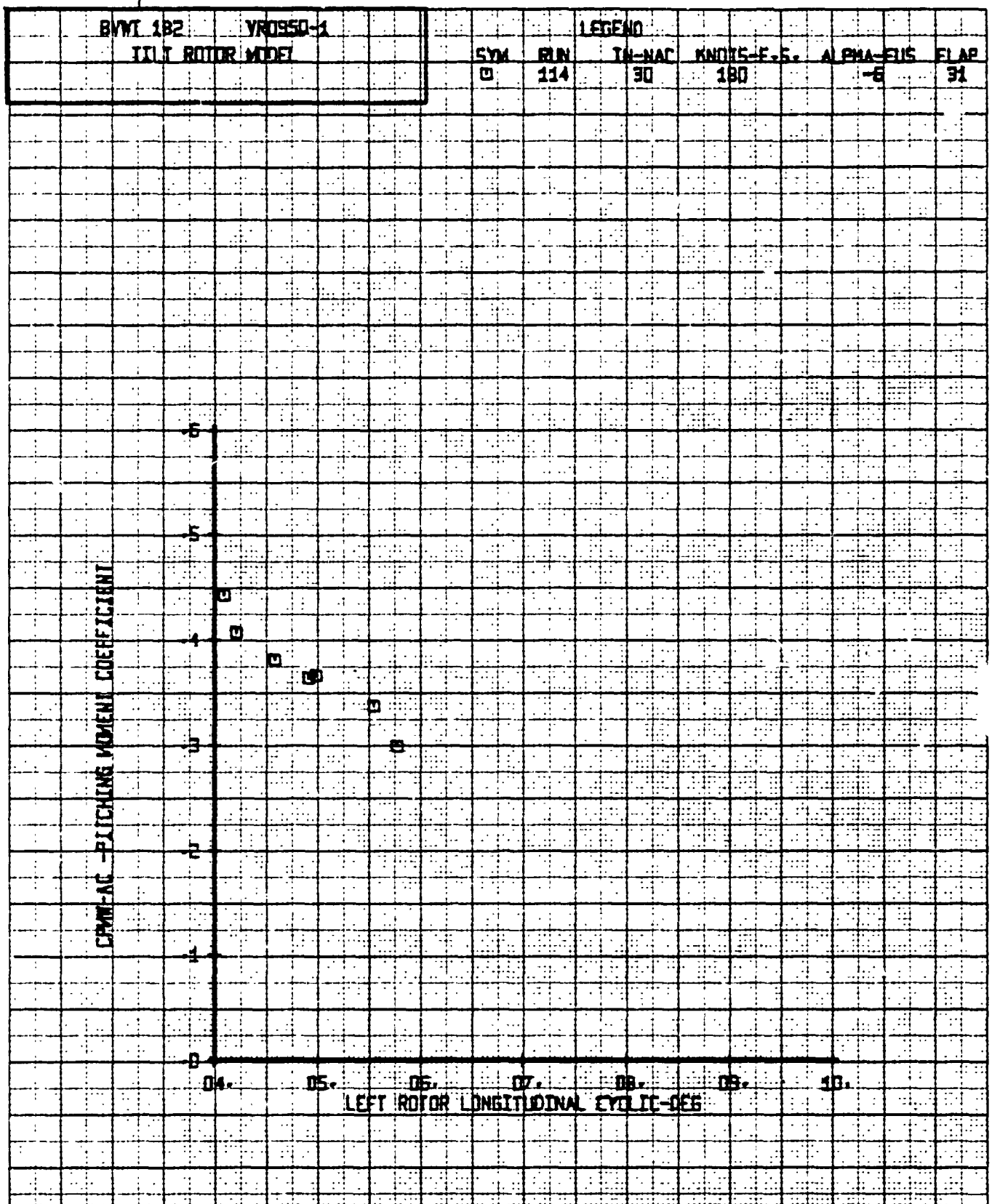


Figure 11-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

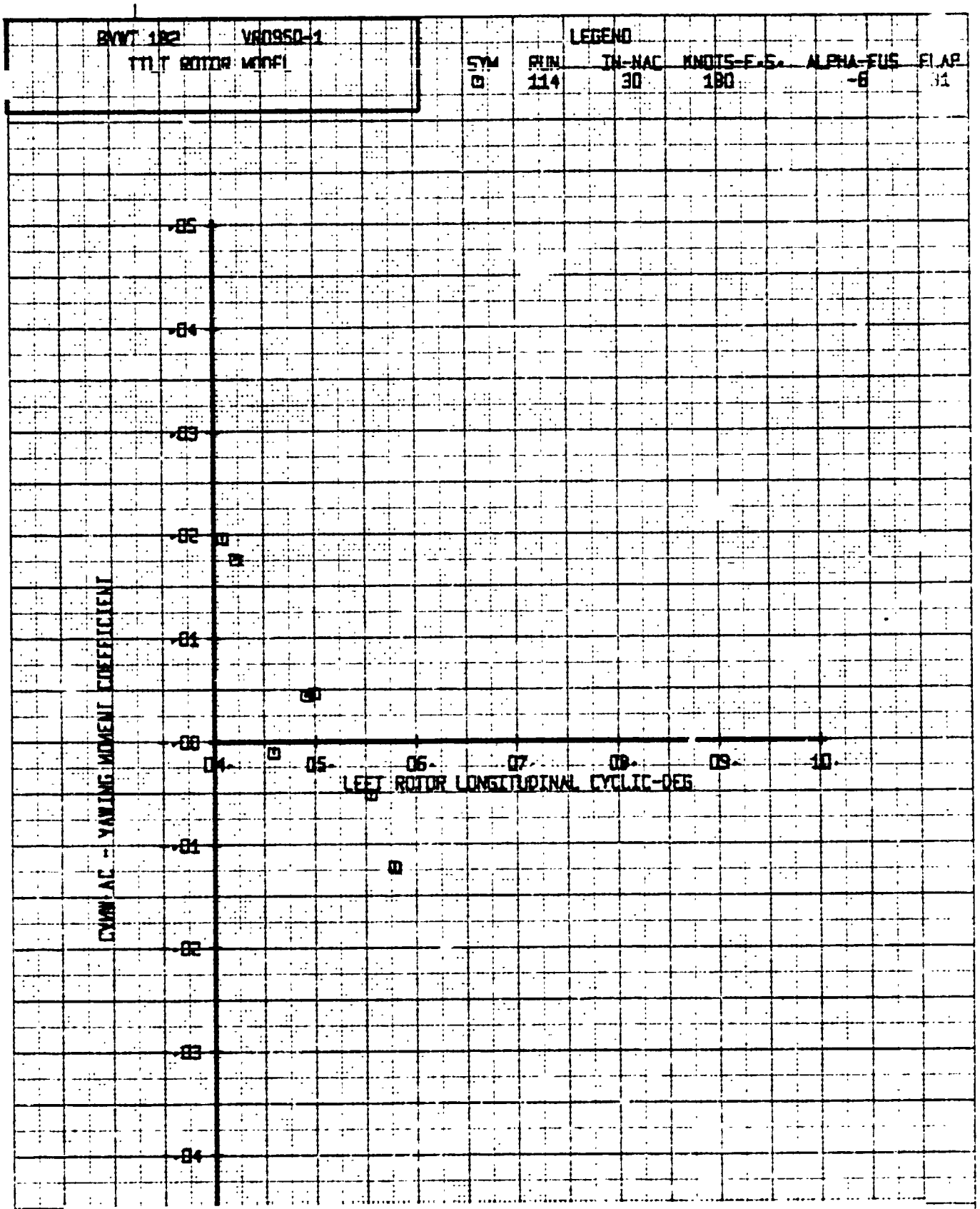


Figure 11-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

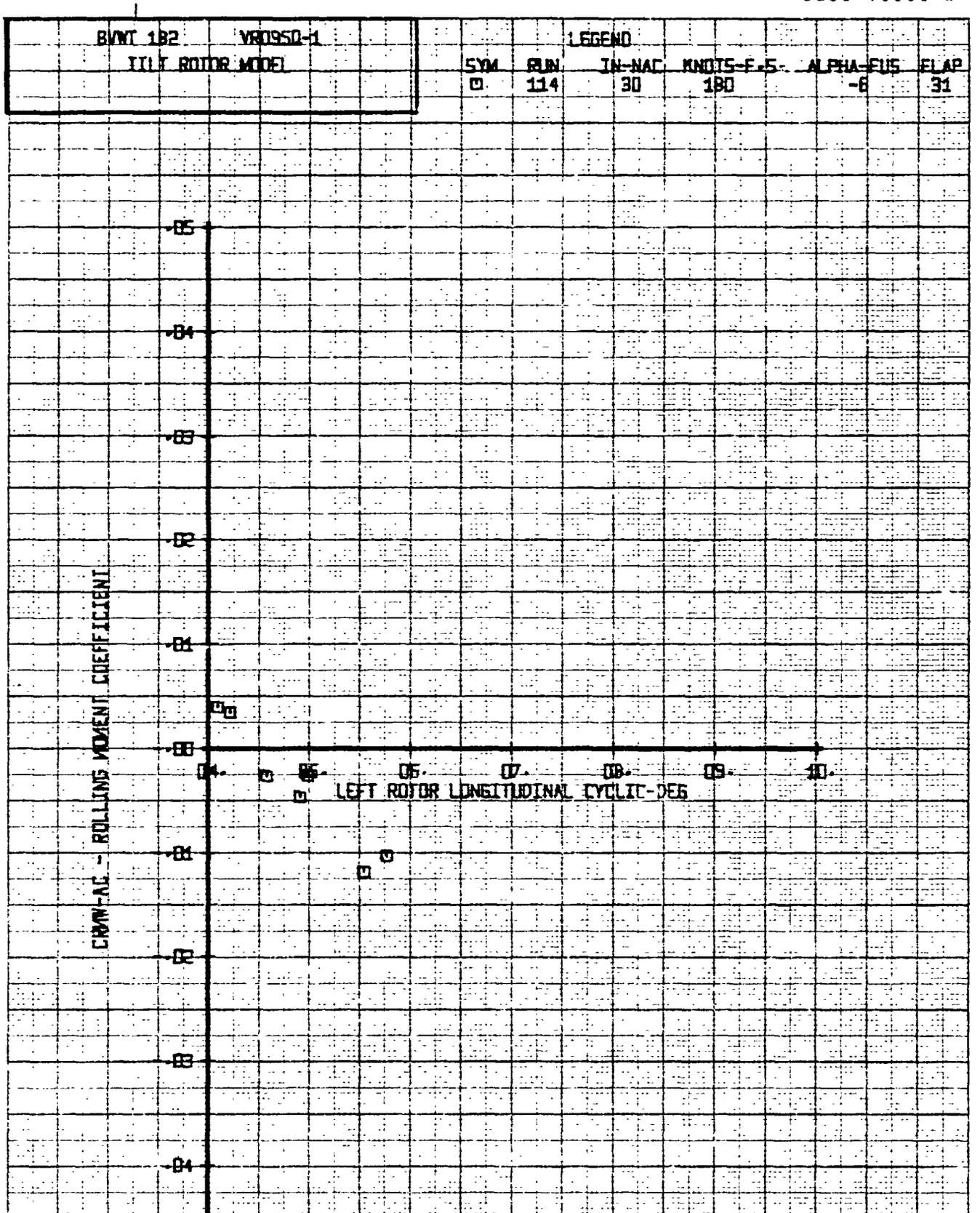


Figure 11-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

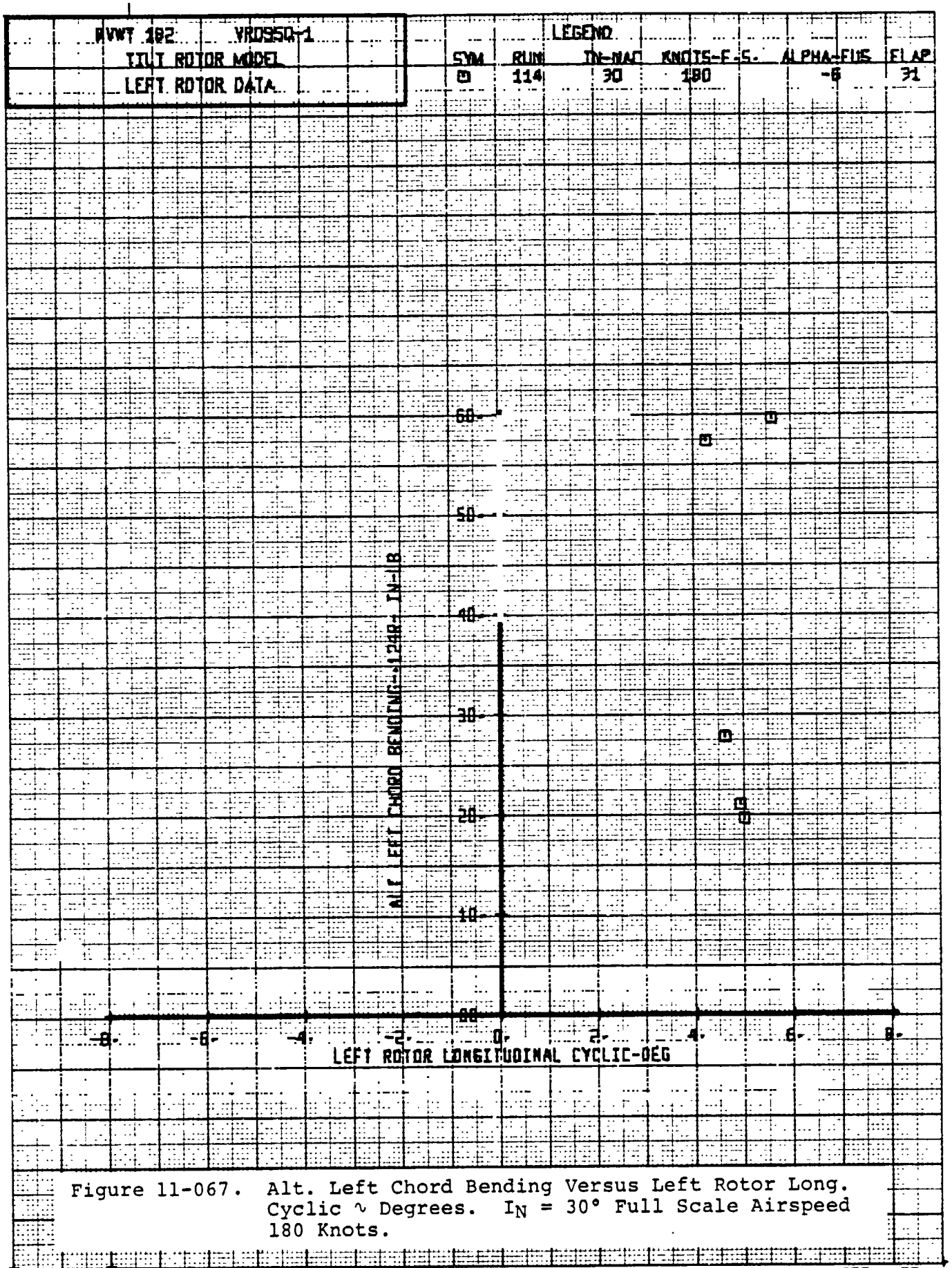


Figure 11-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

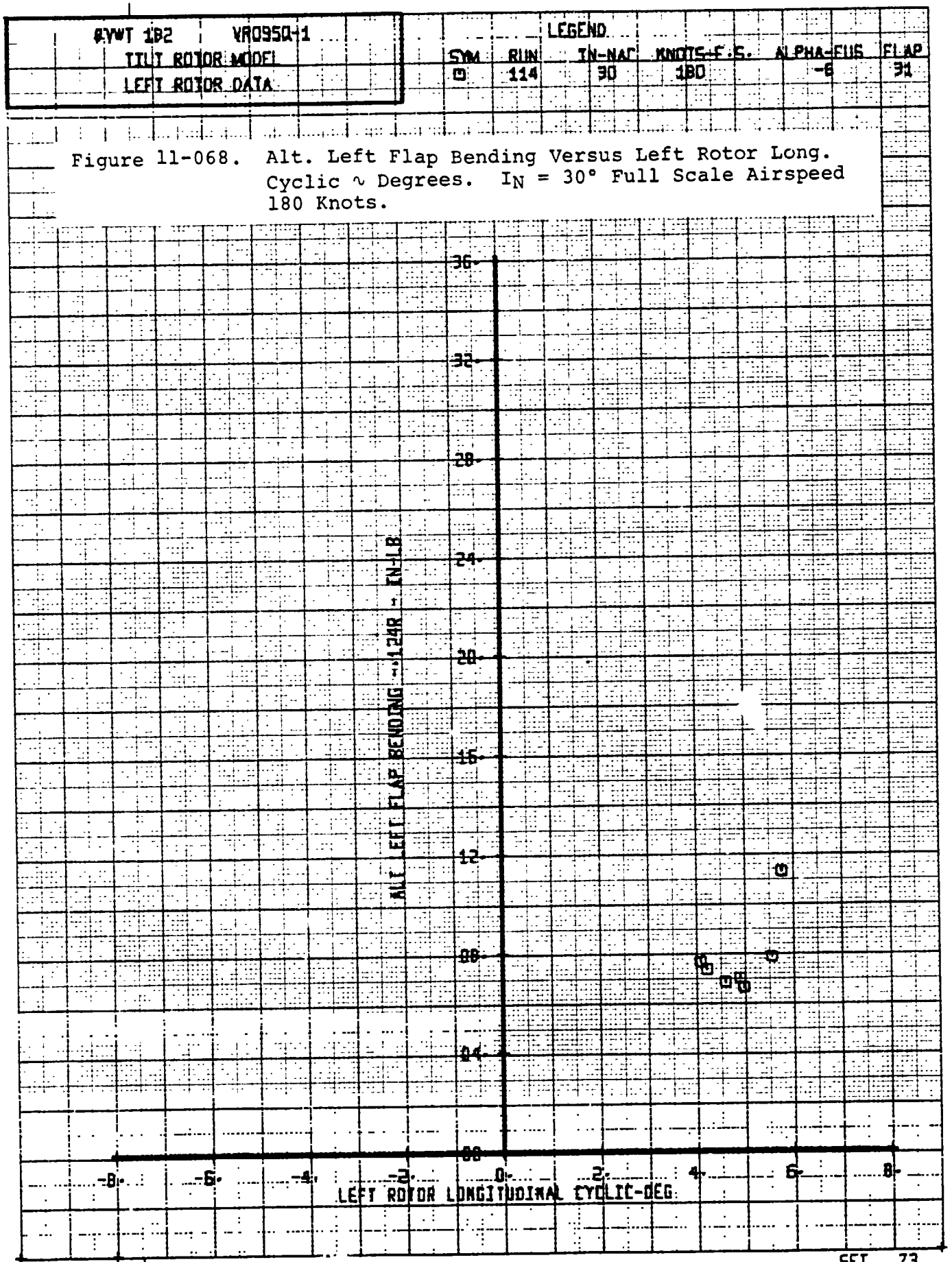
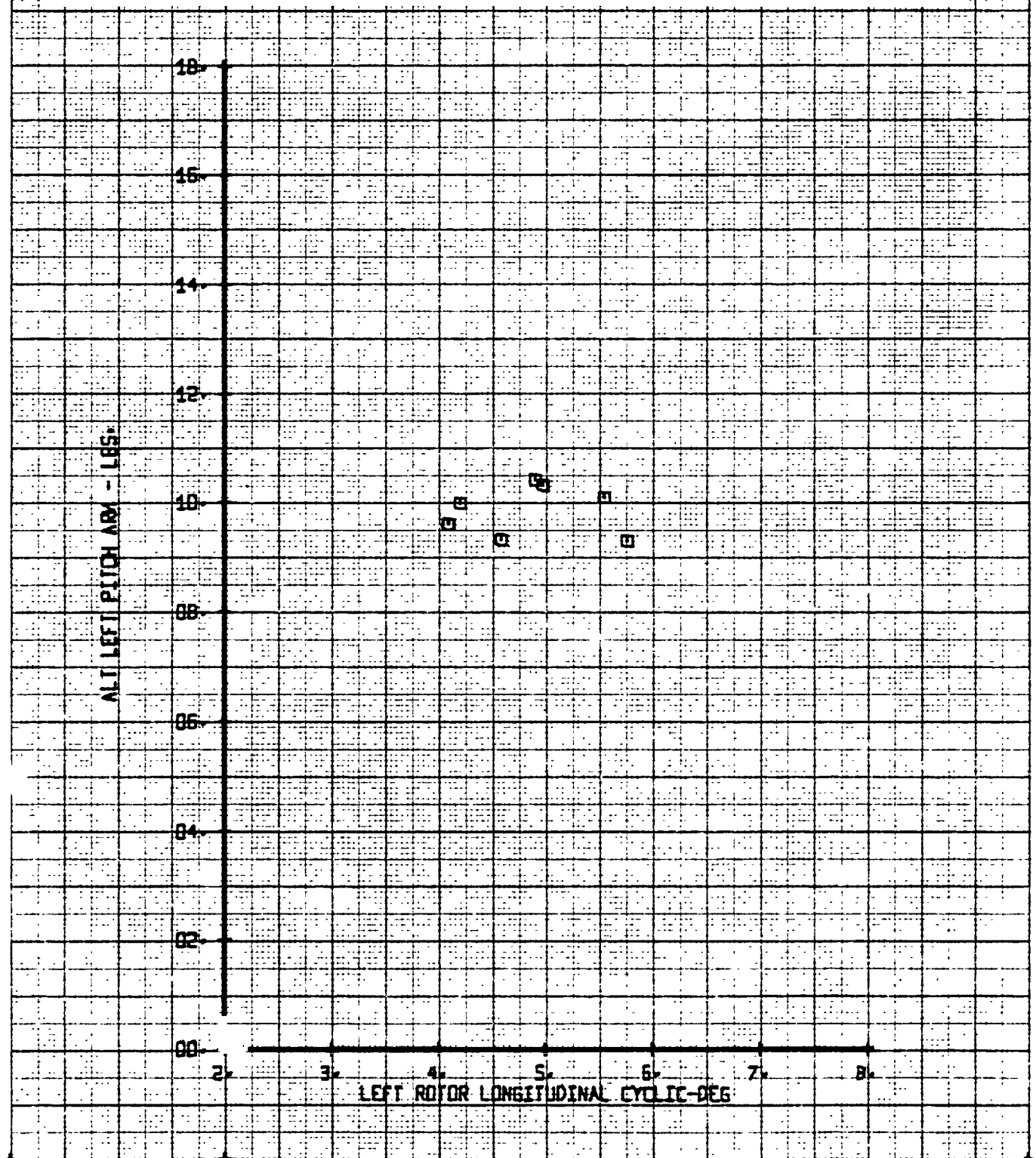


Figure 11-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VRTOL50-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	114	30	180	-6	31

Figure 11-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



ET 73
W 182

SET 73
BVWT 182

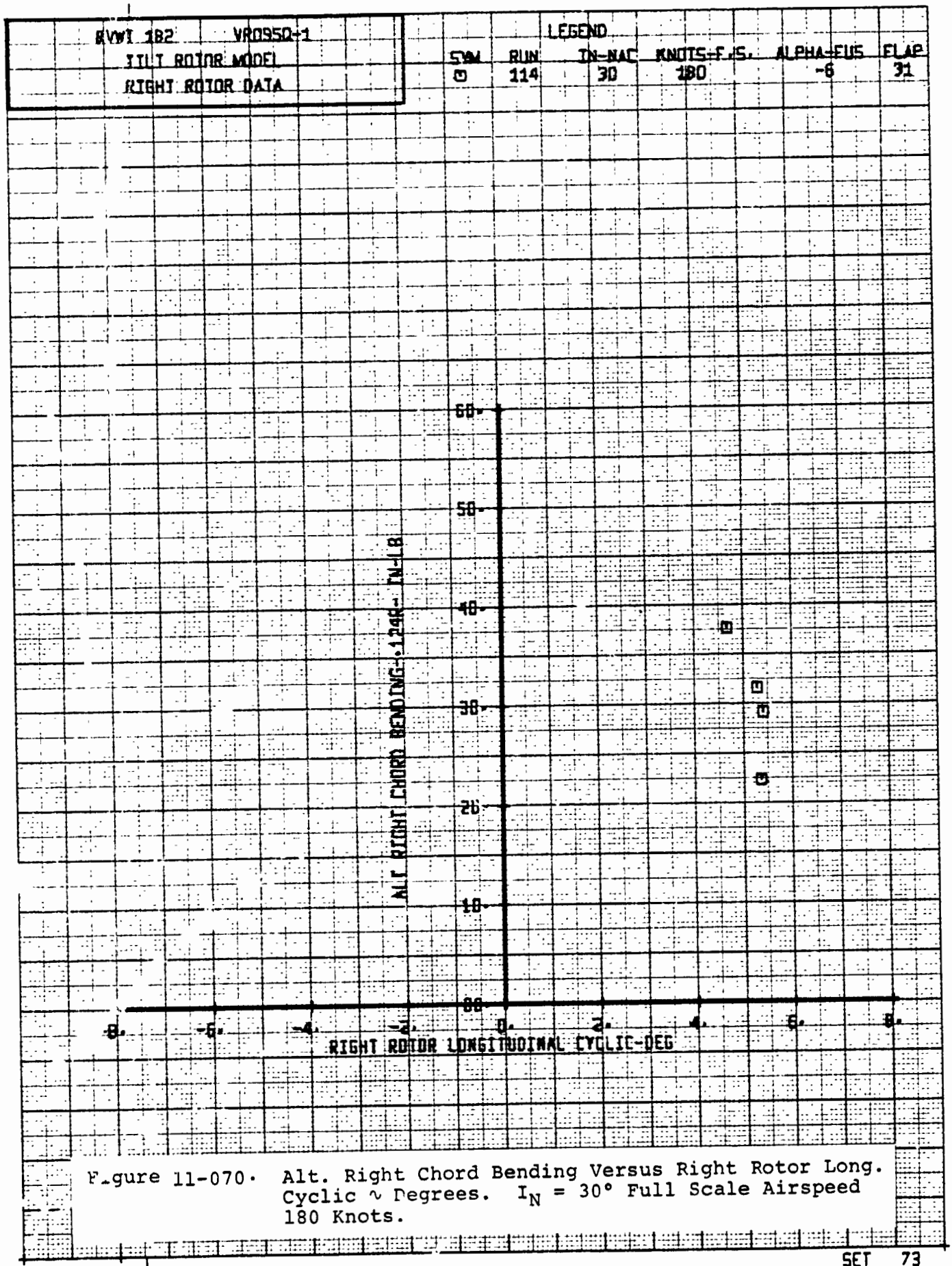


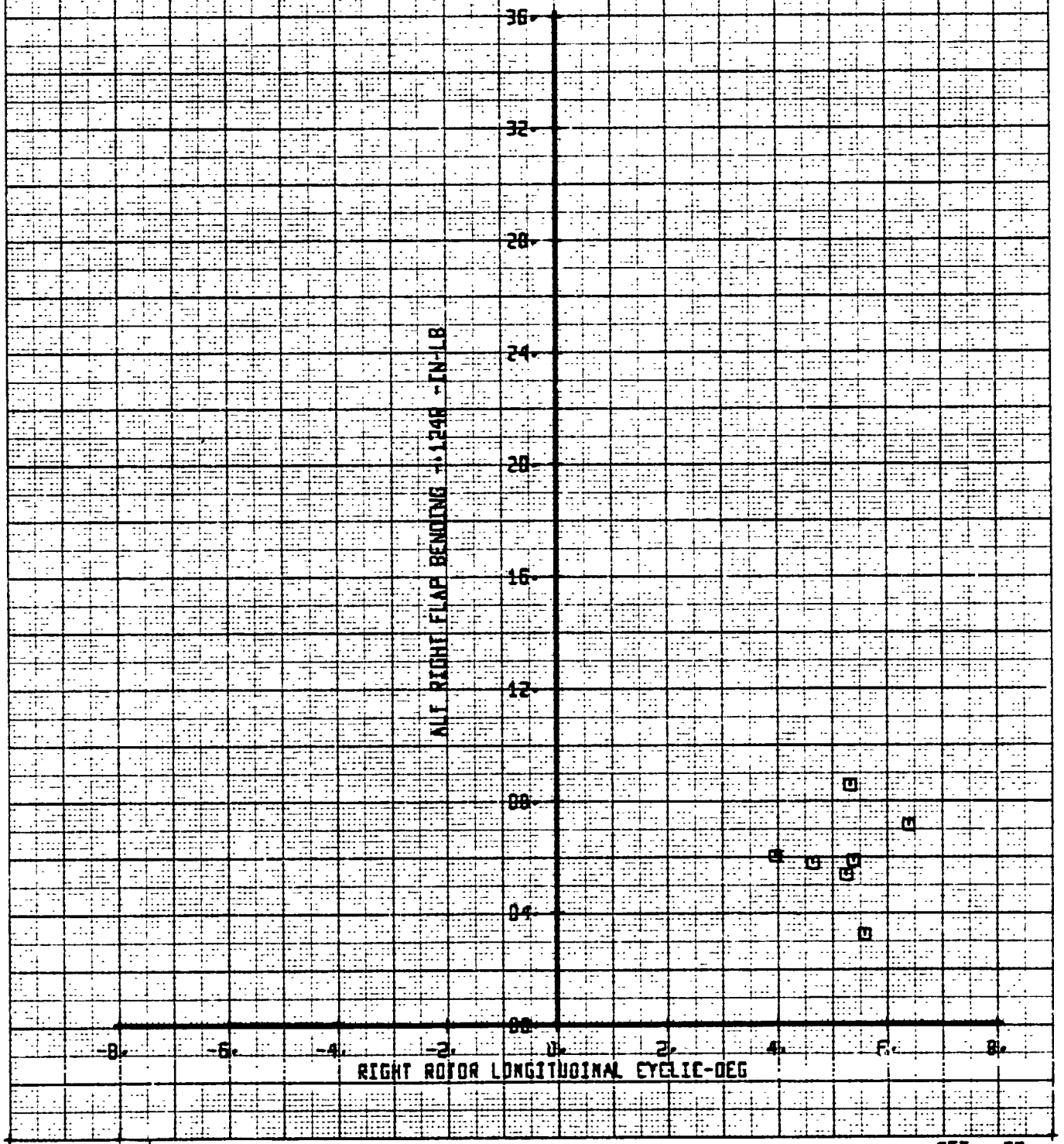
Figure 11-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VRD950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	114	30	180	-6	31

Figure 11-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

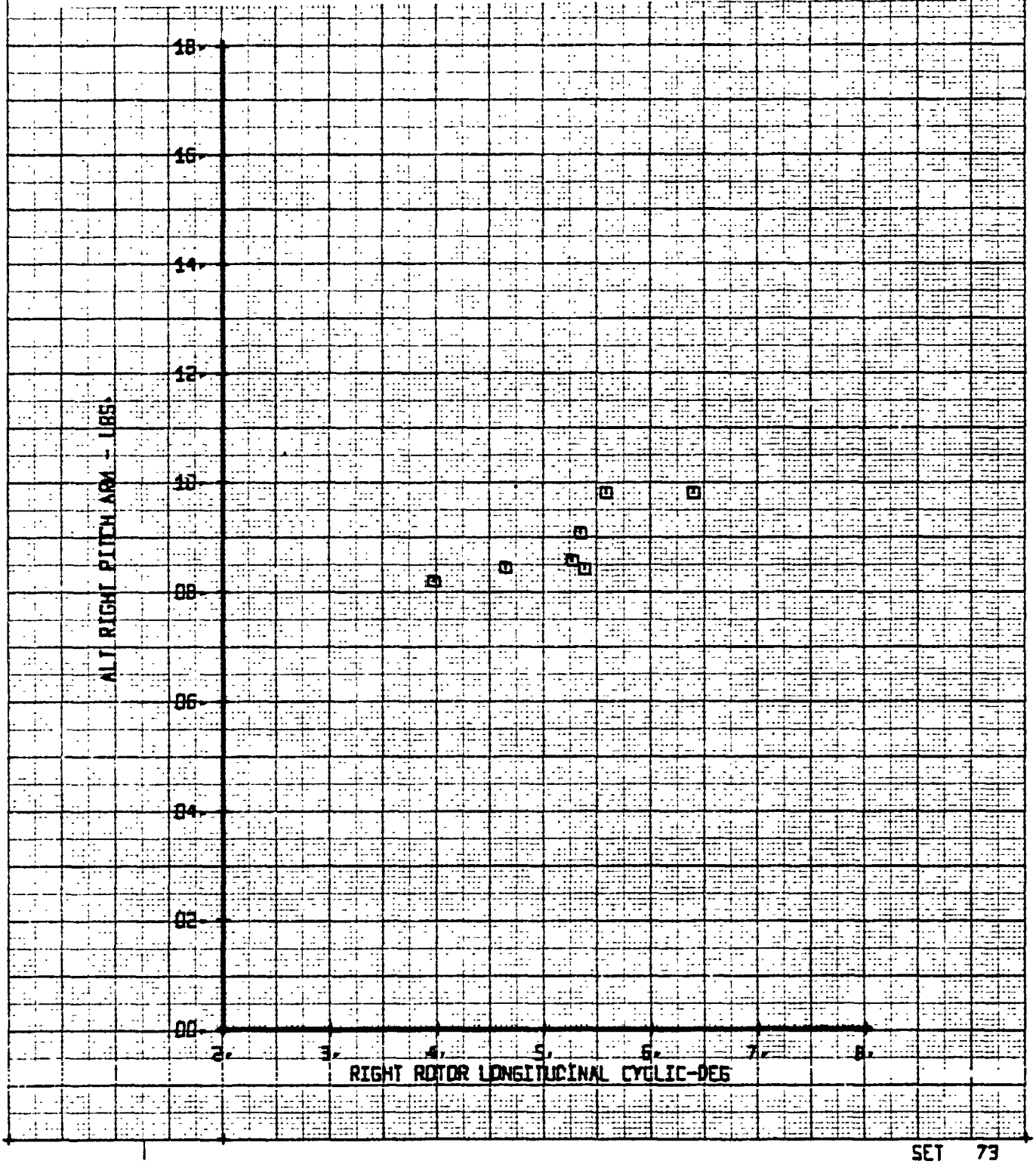


BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	114	90	180	-6	31

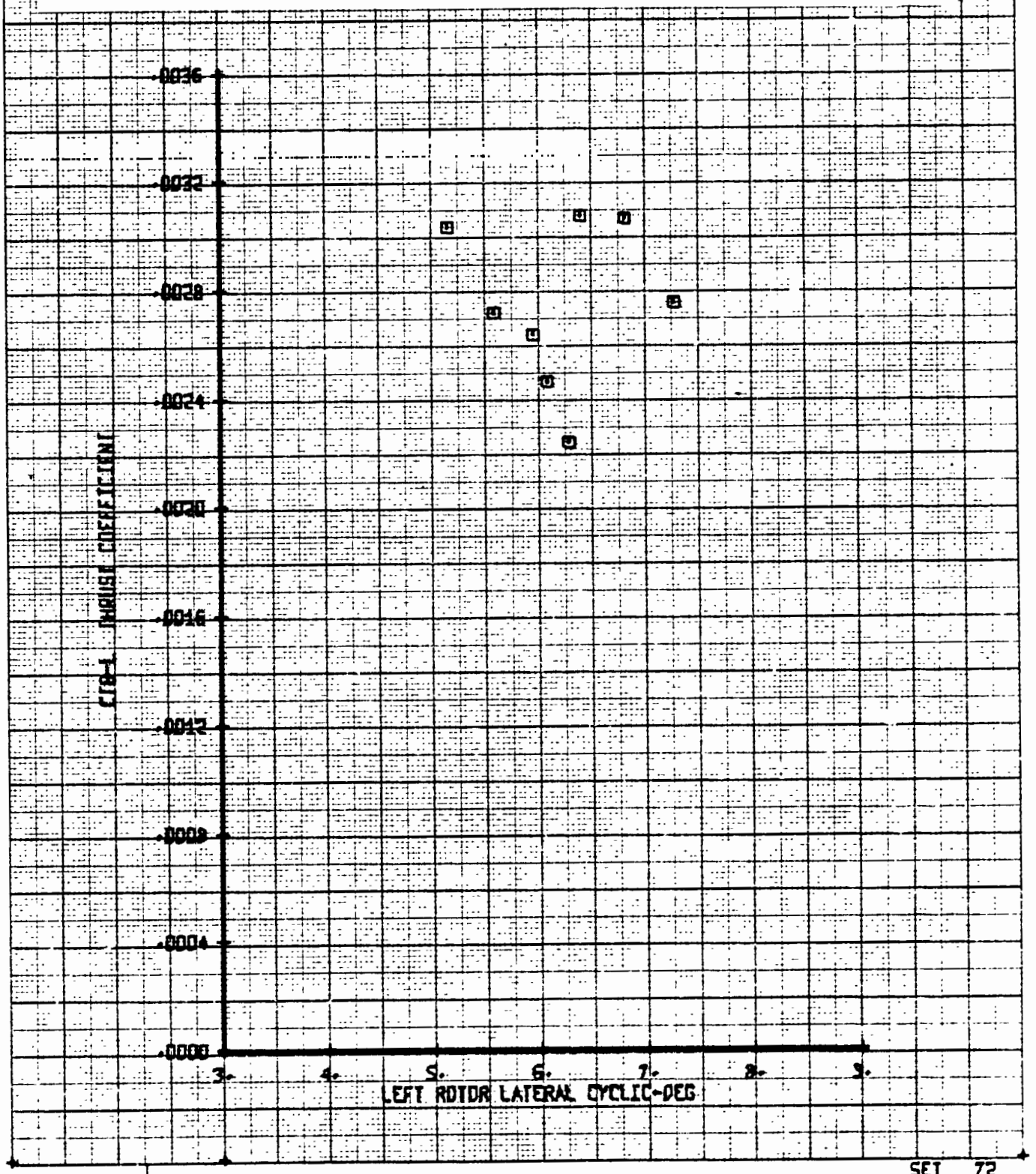
Figure 11-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	113	30	100	-6	31

Figure 11-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



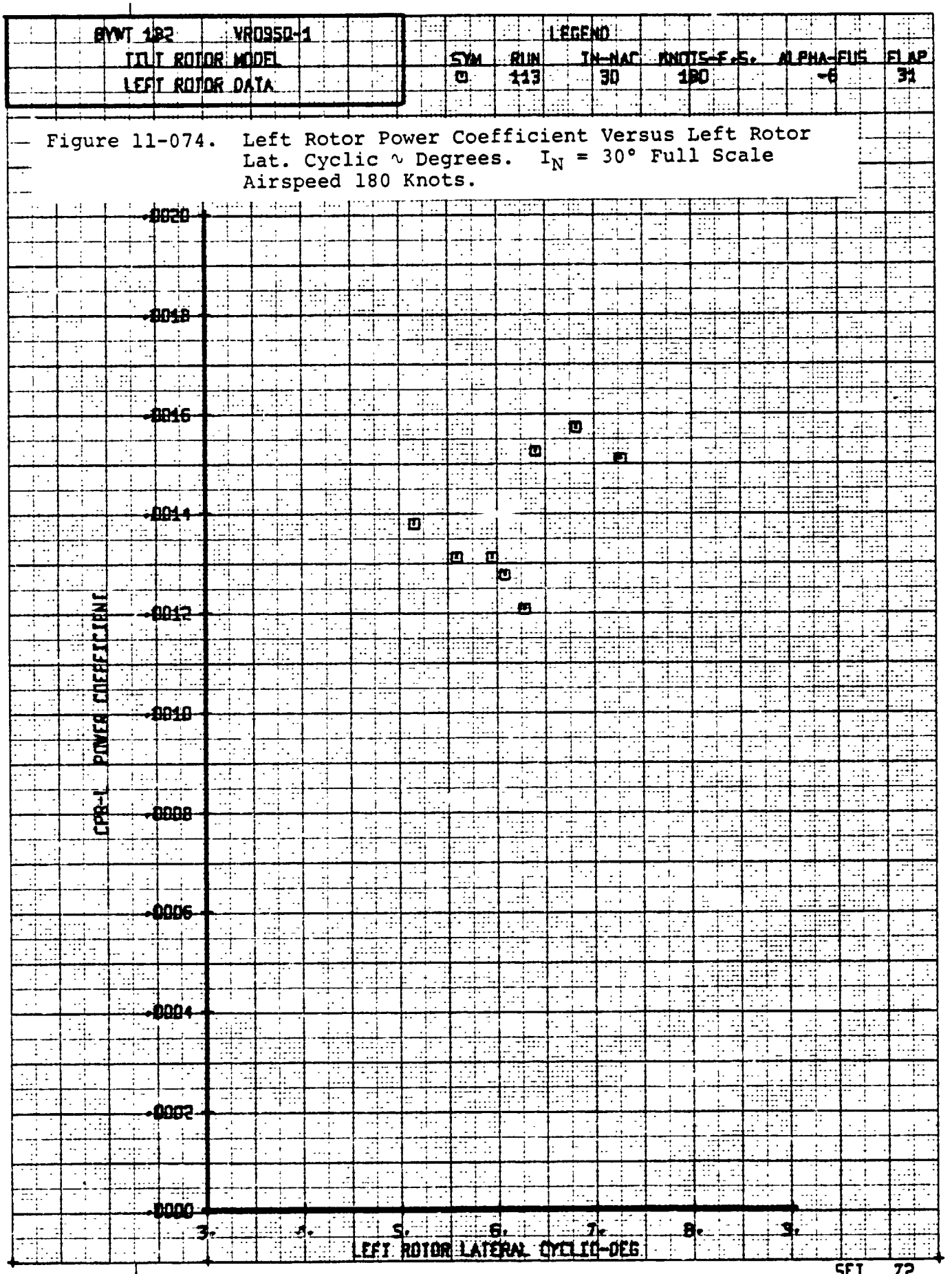


Figure 11-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

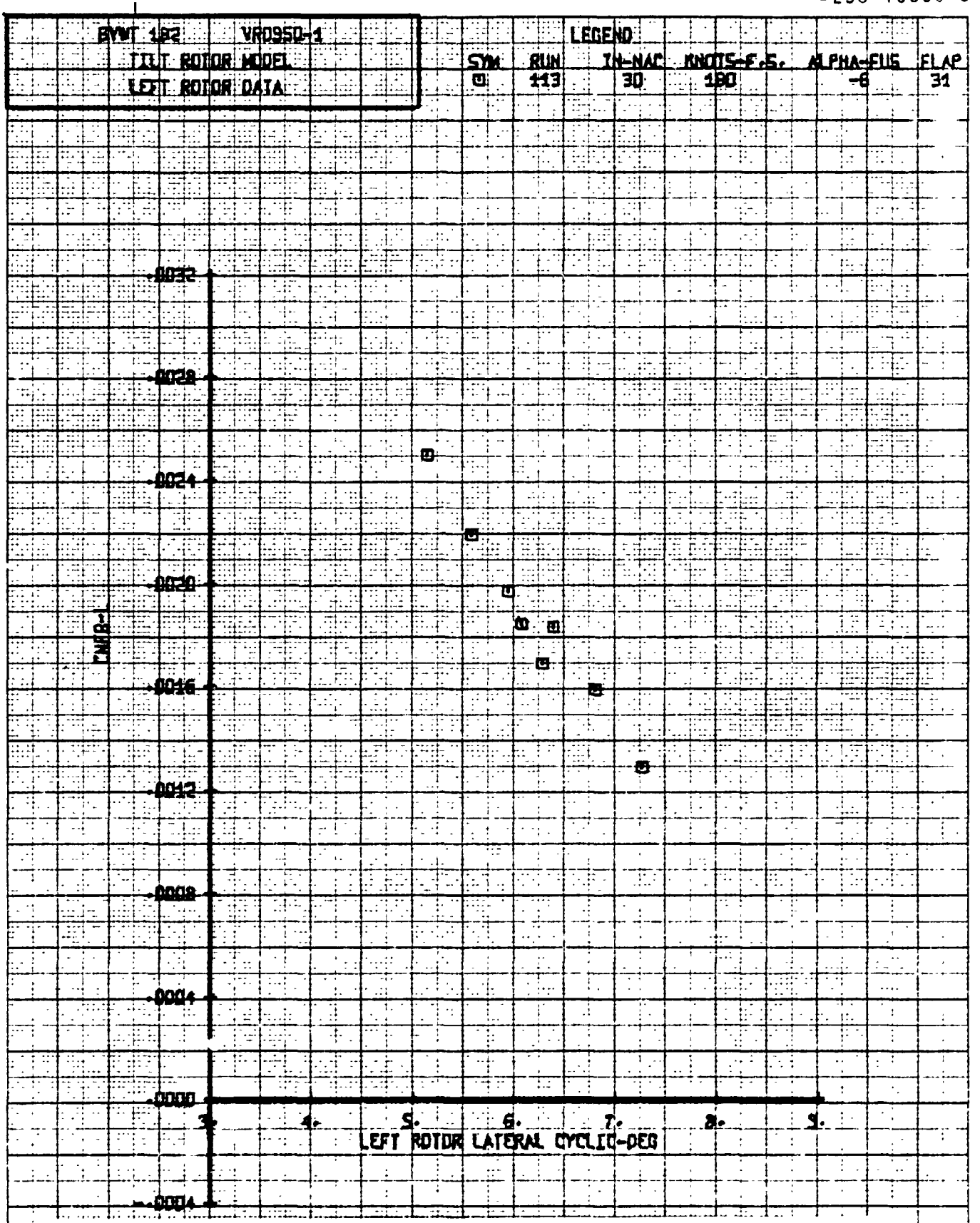


Figure 11-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

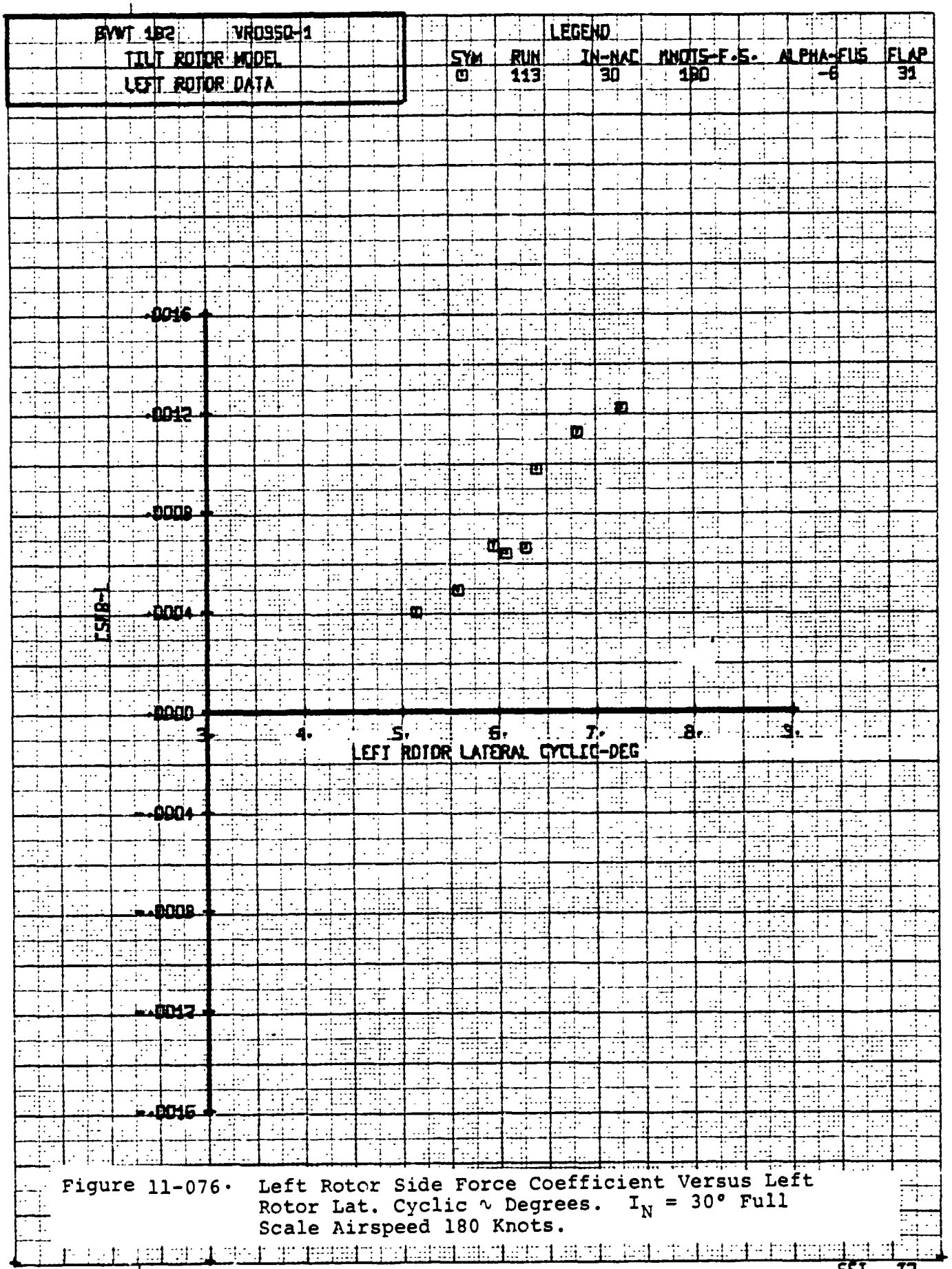


Figure 11-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

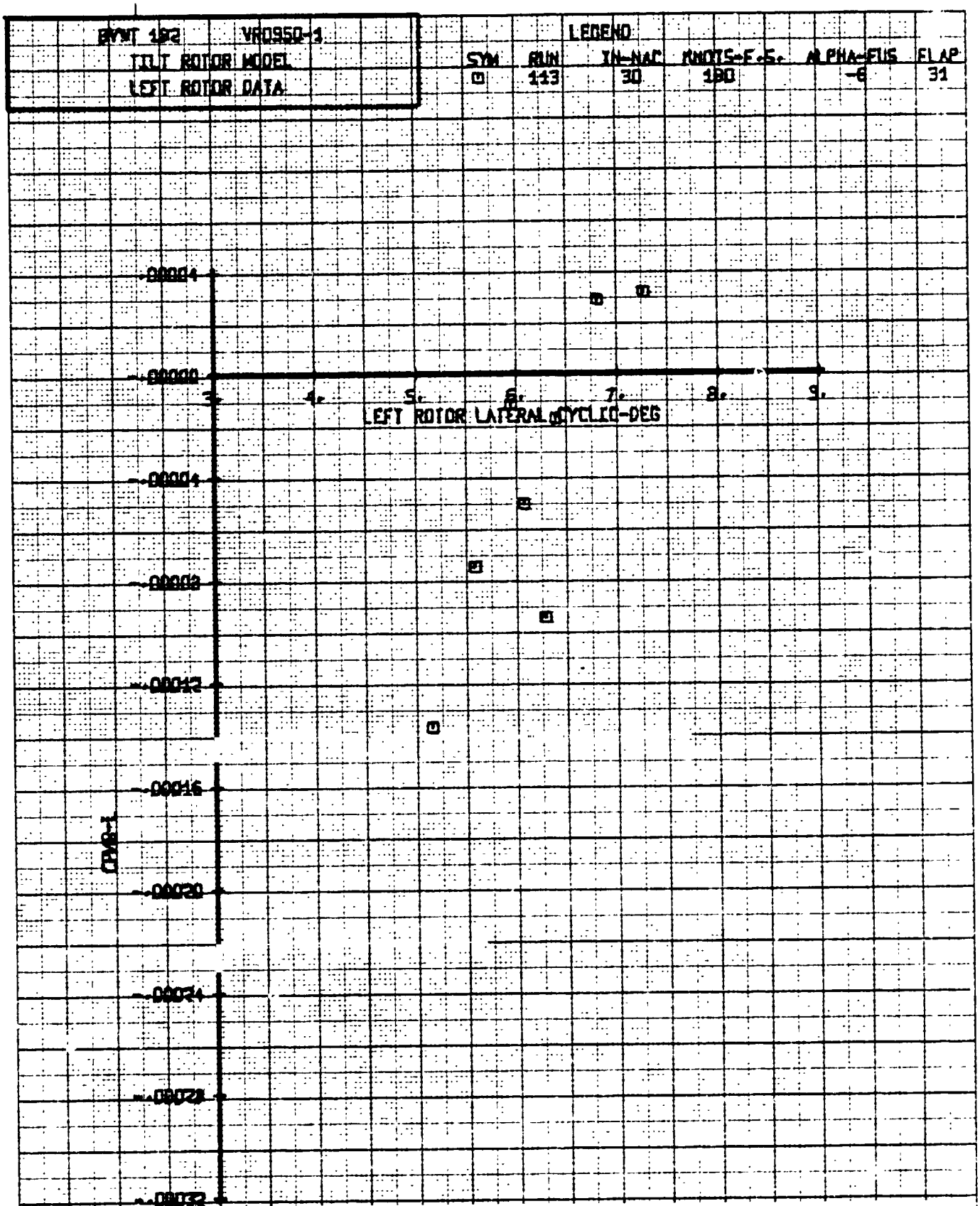


Figure 11-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

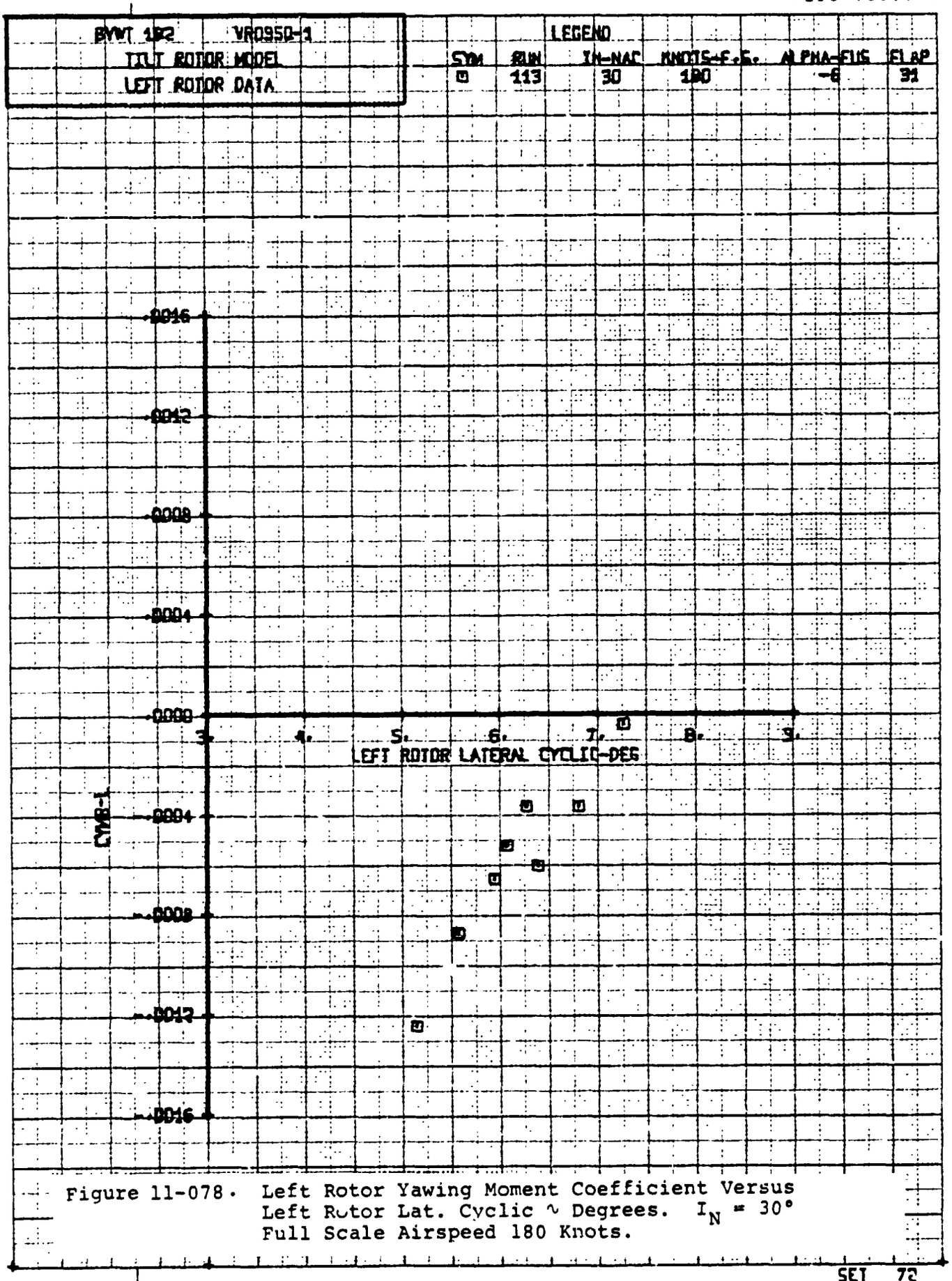


Figure 11-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

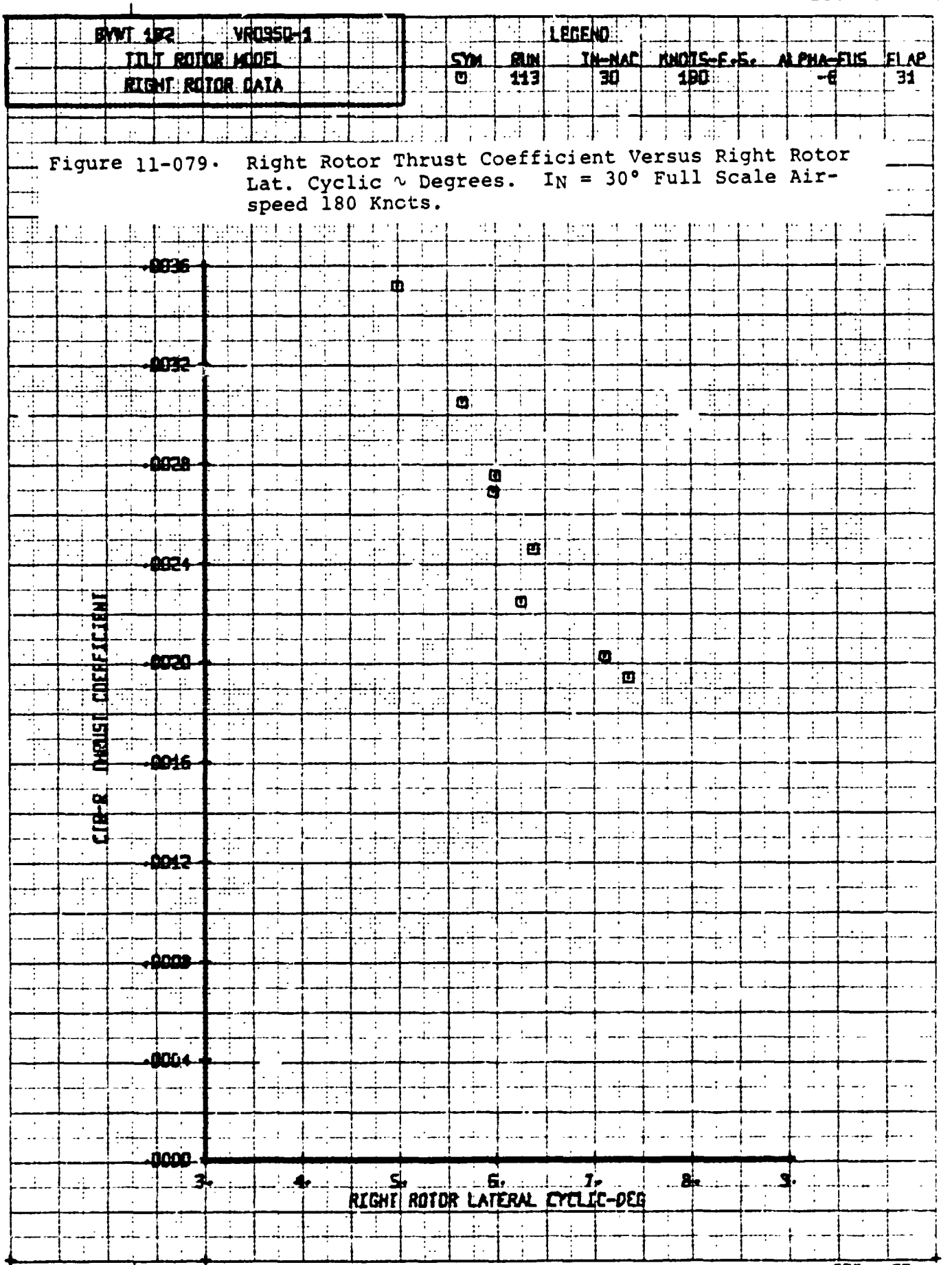


Figure 11-079. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

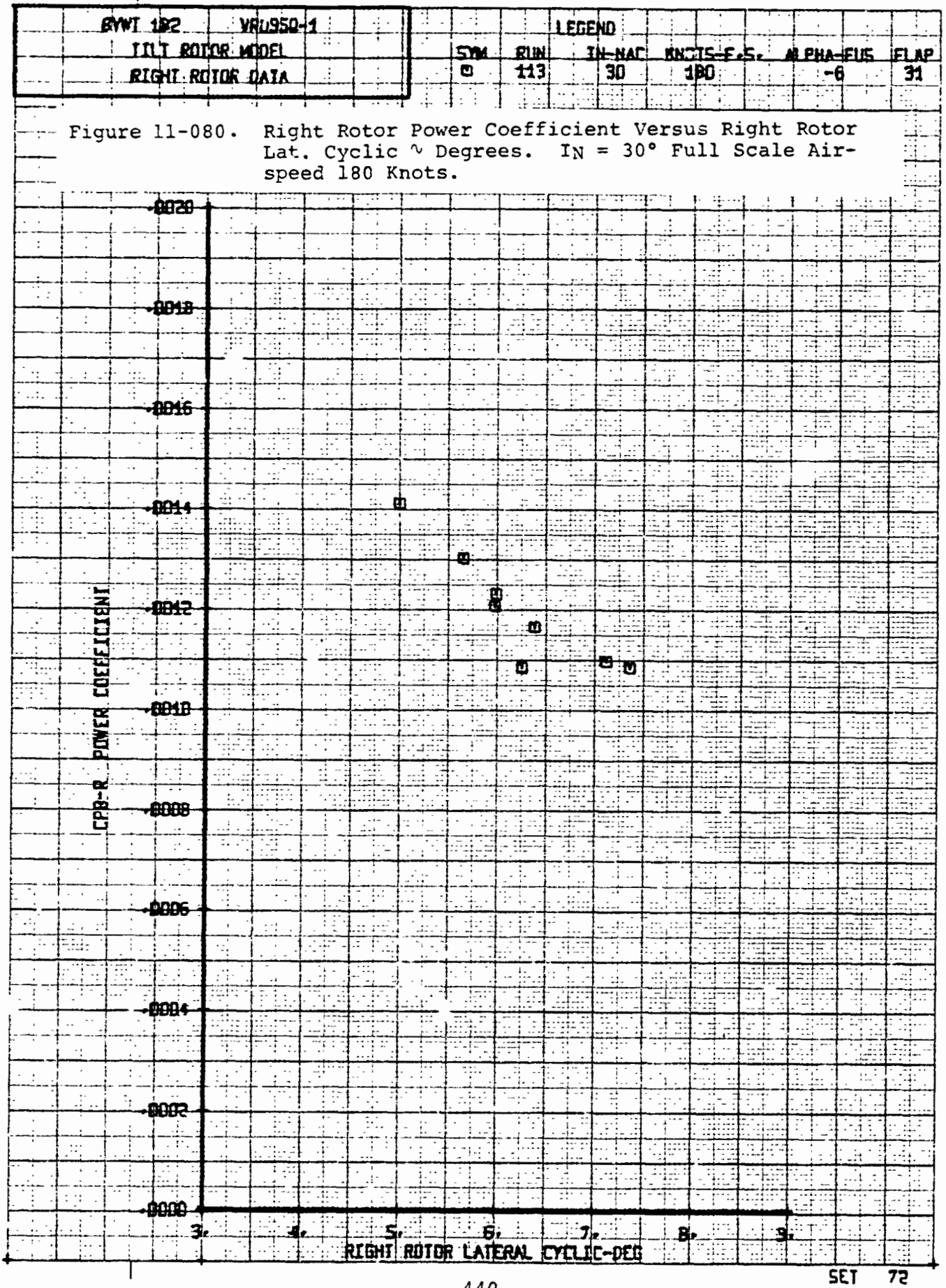


Figure 11-080. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

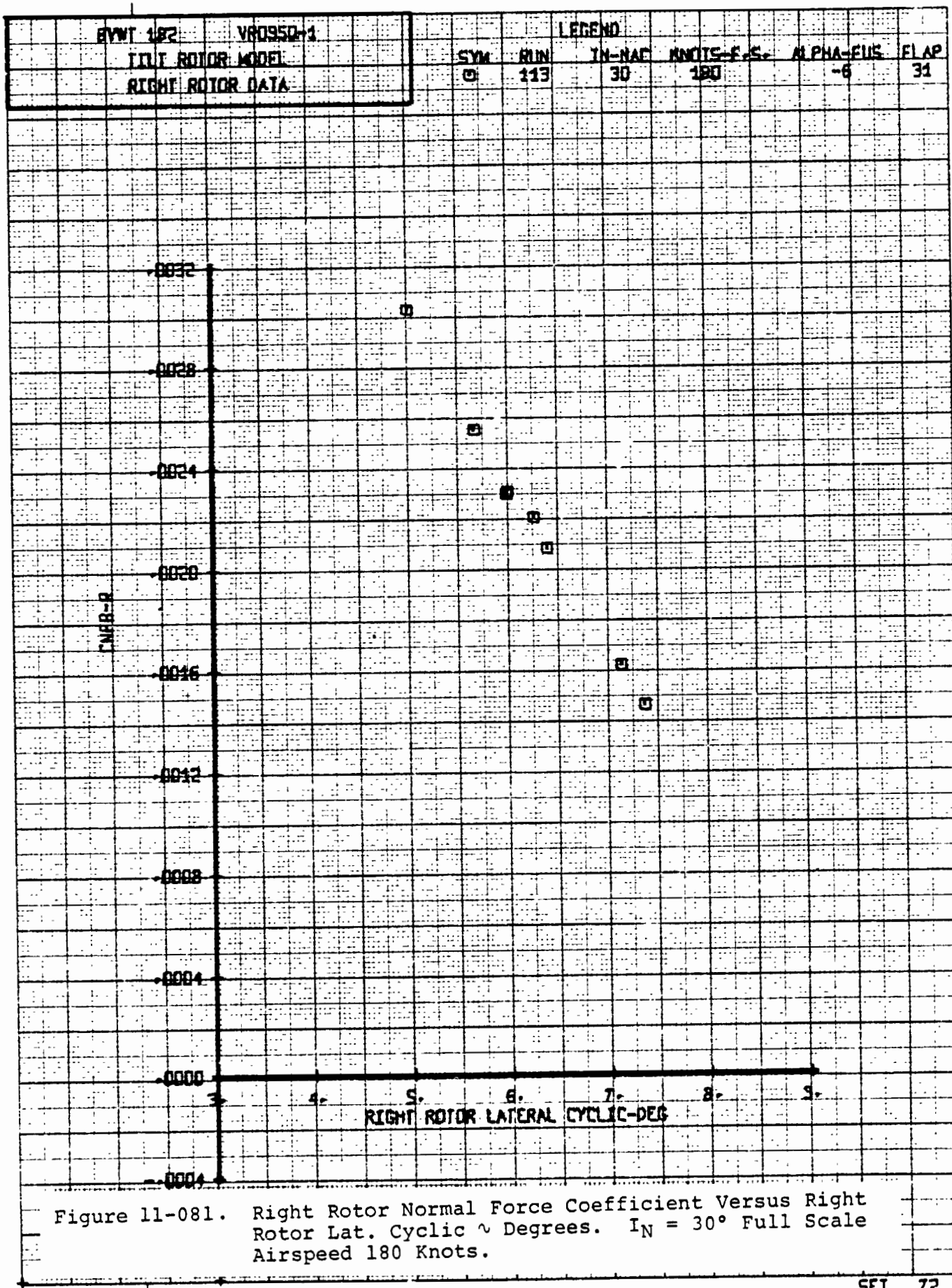


Figure 11-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

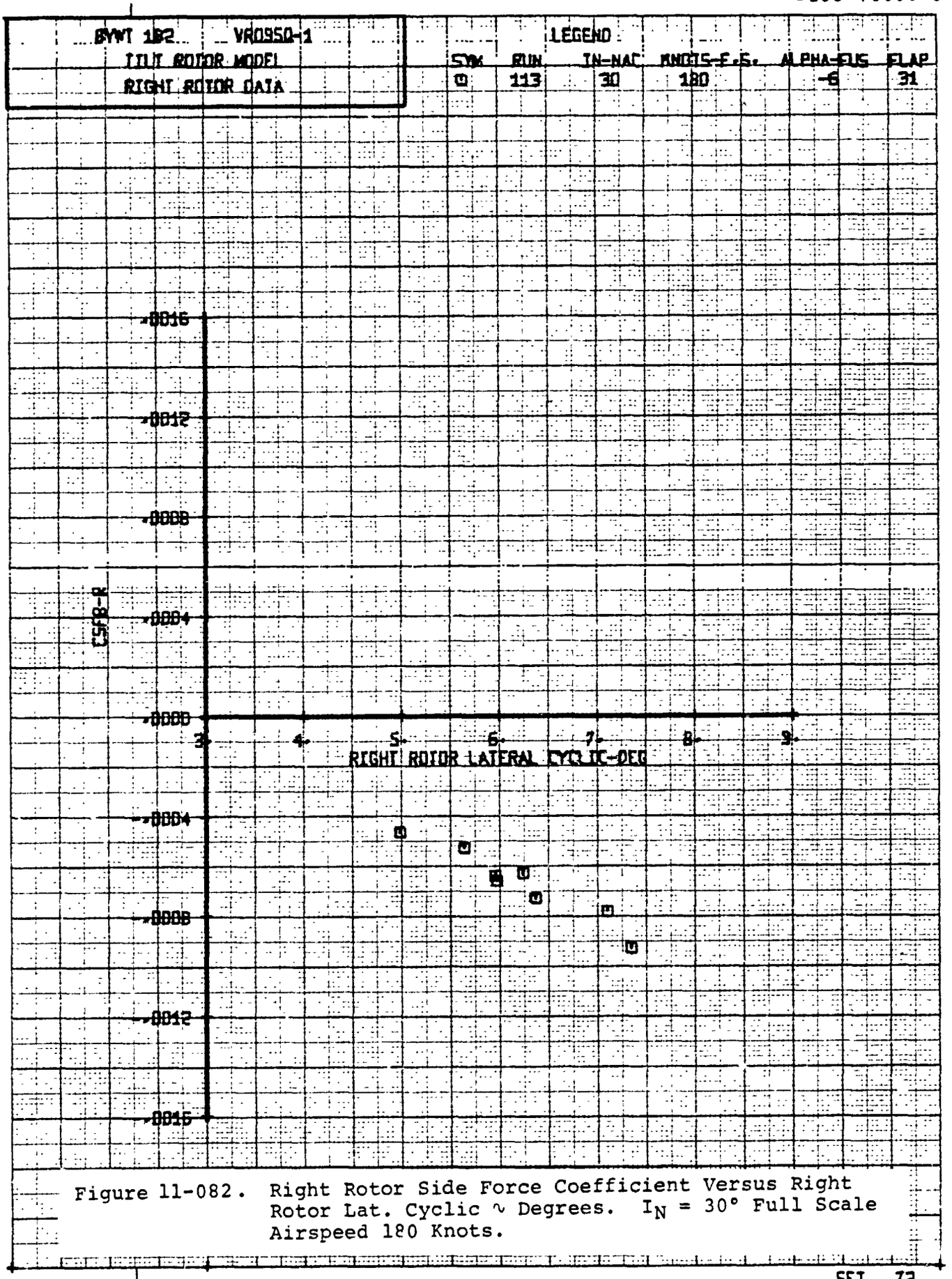


Figure 11-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

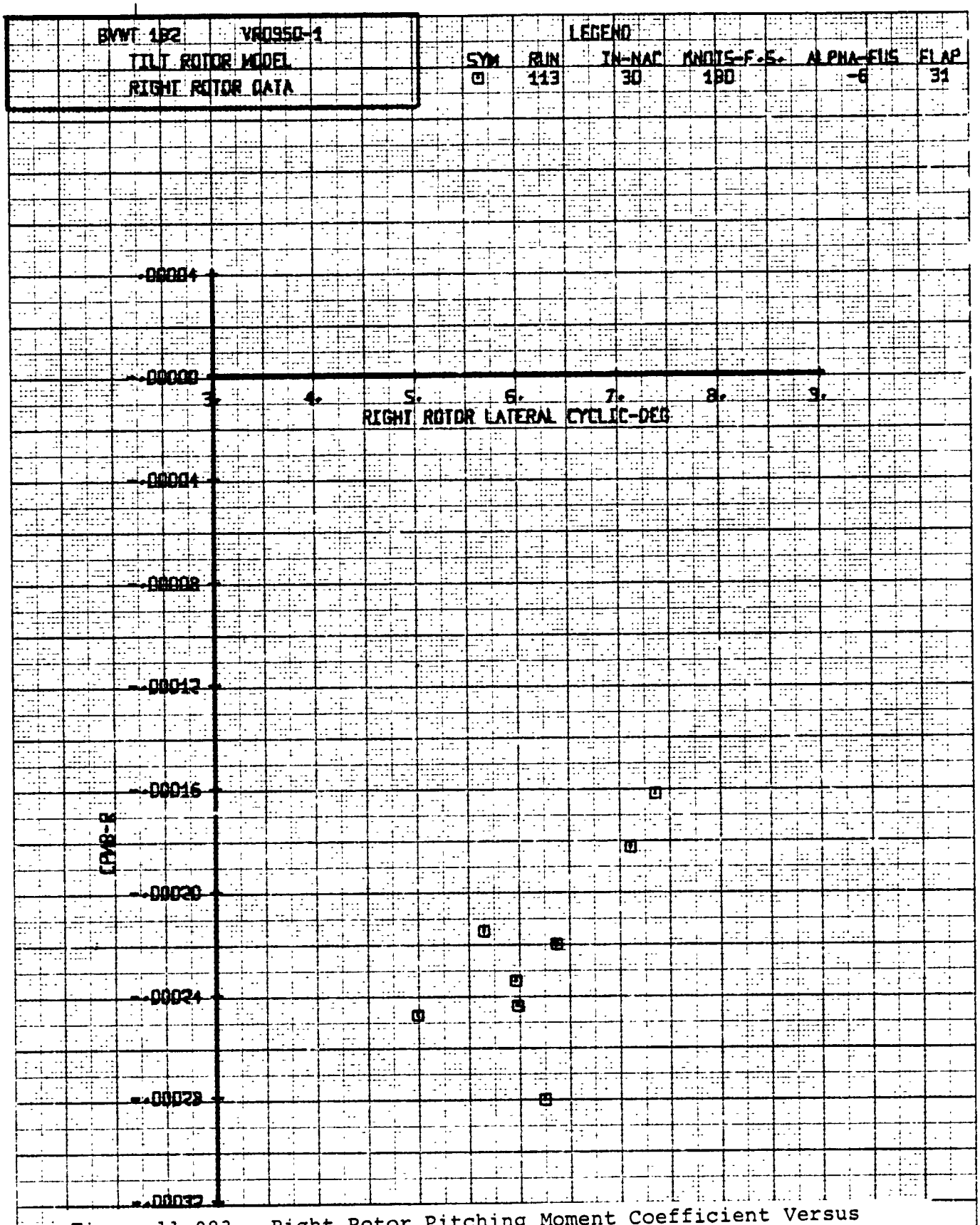


Figure 11-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

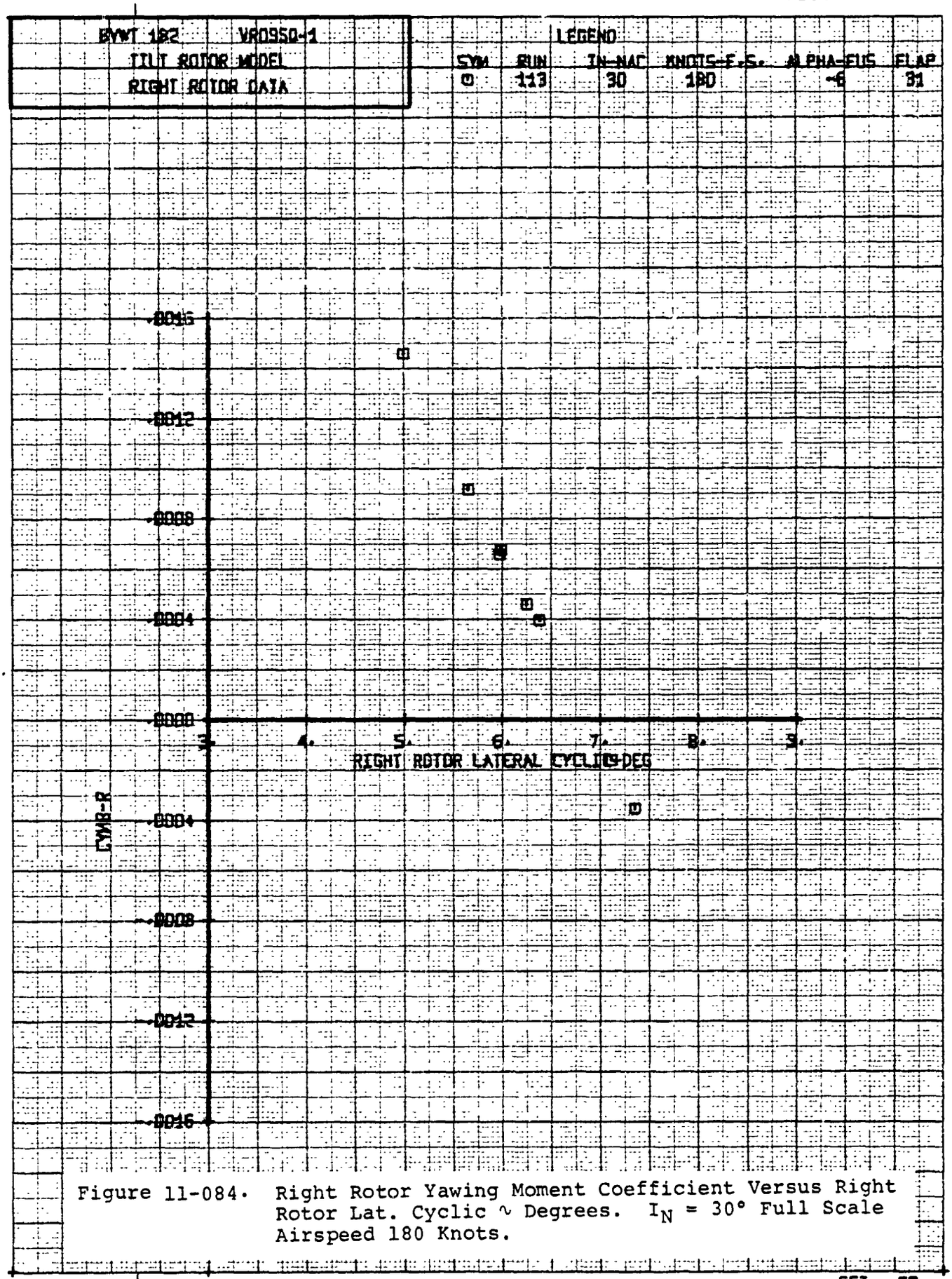


Figure 11-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

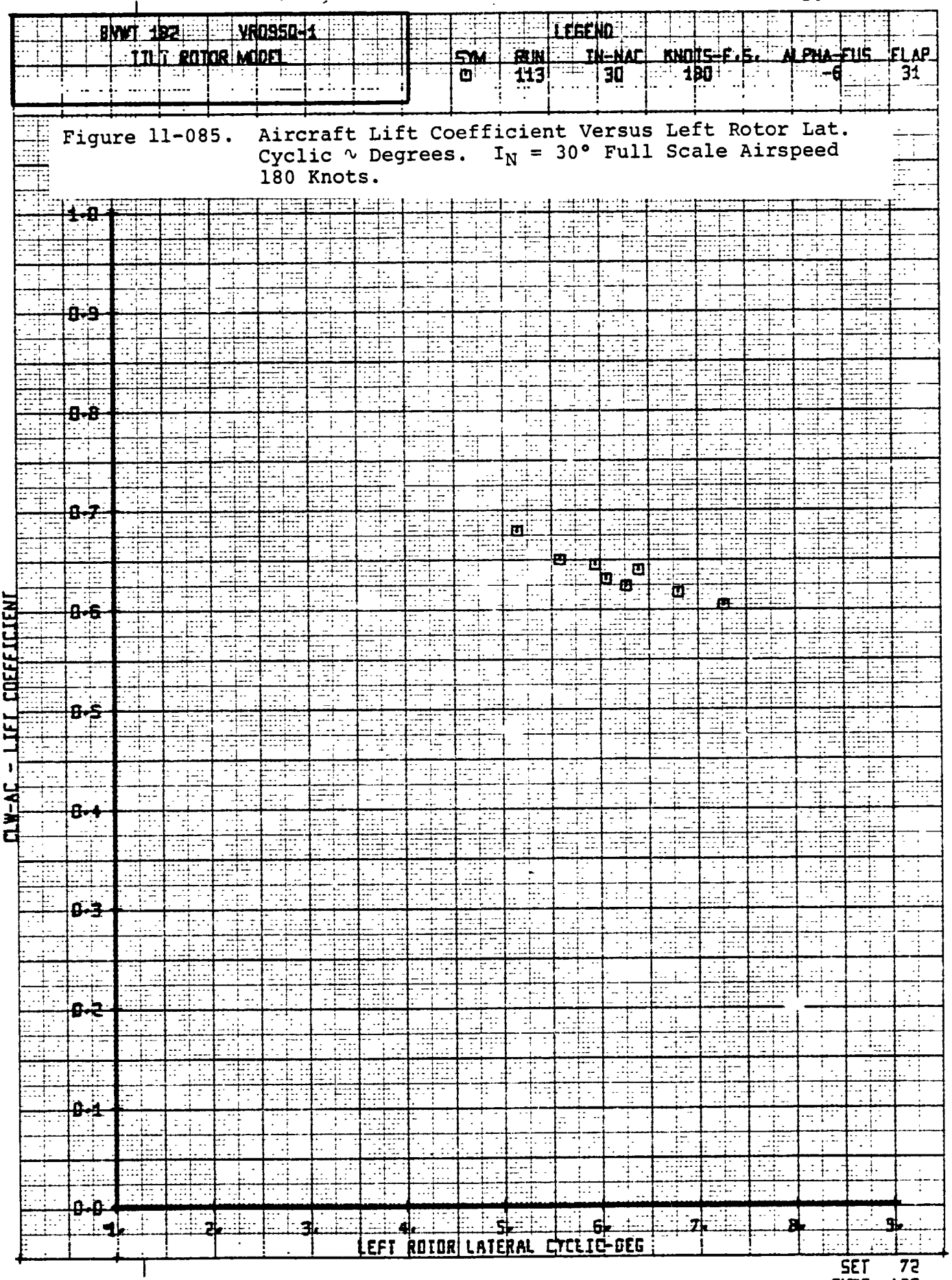


Figure 11-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

ET 72
W 182

SET 72
BWT 182

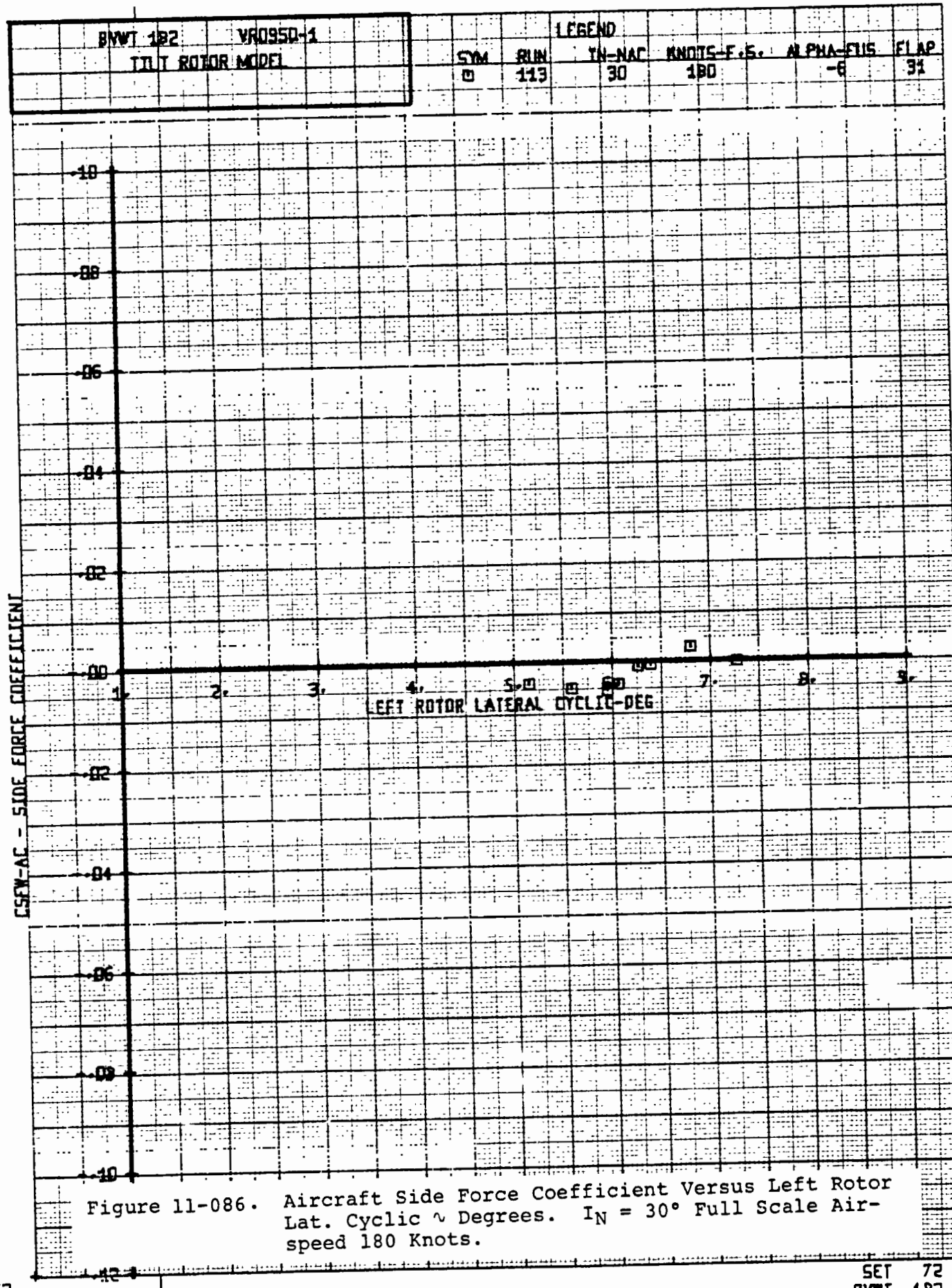


Figure 11-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

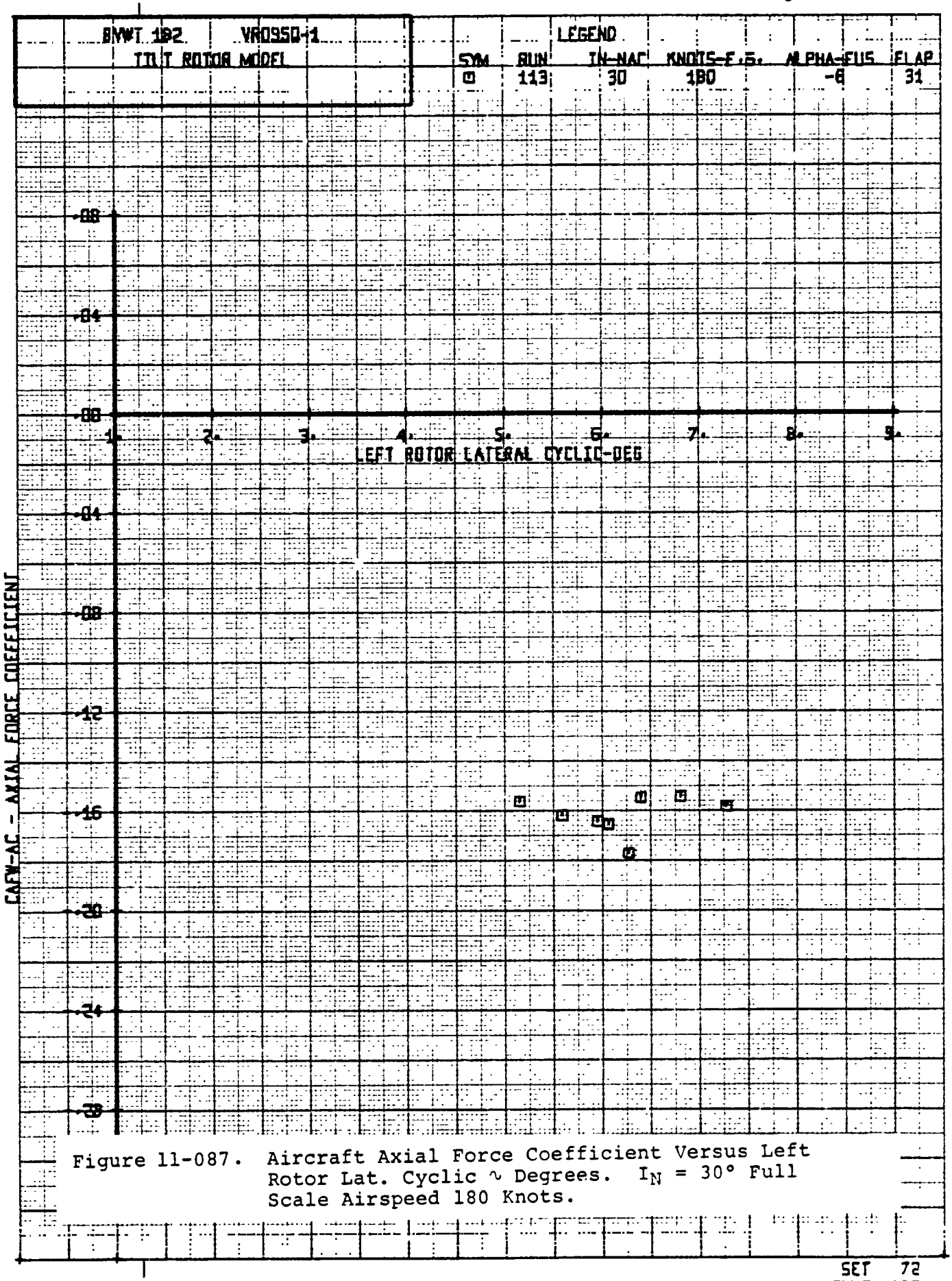


Figure 11-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 72
1 182

SET 72
BVWT 182

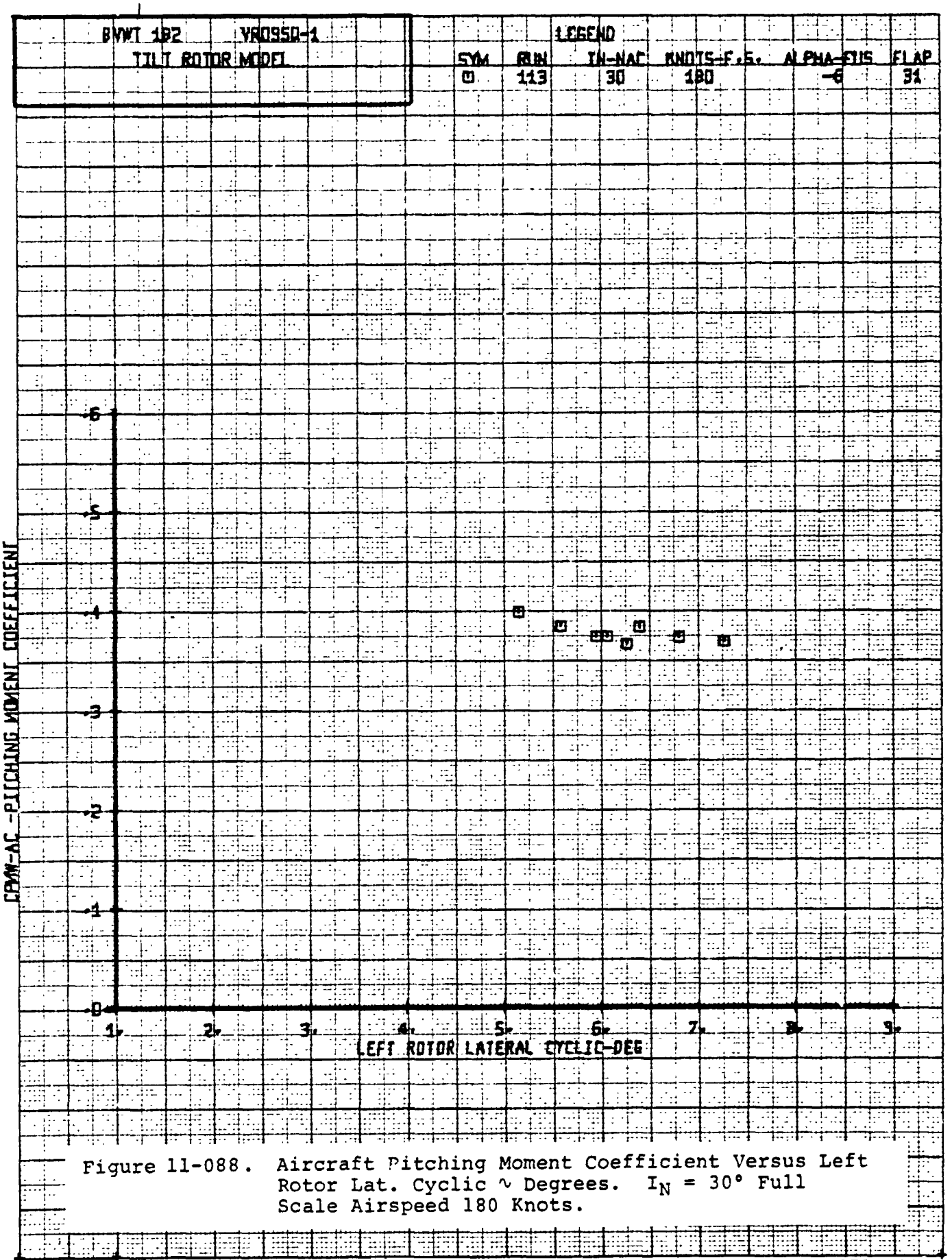


Figure 11-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

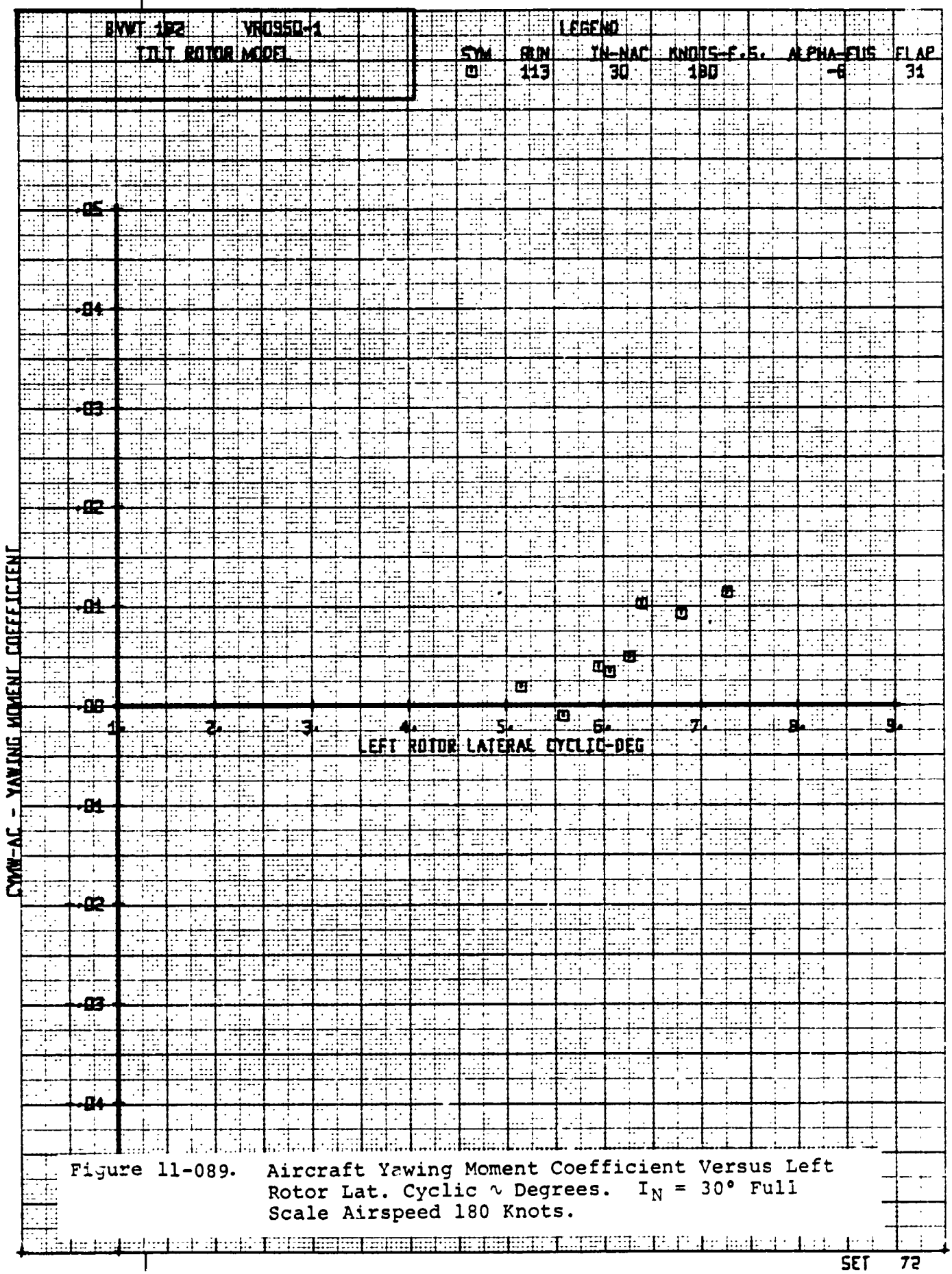


Figure 11-089. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

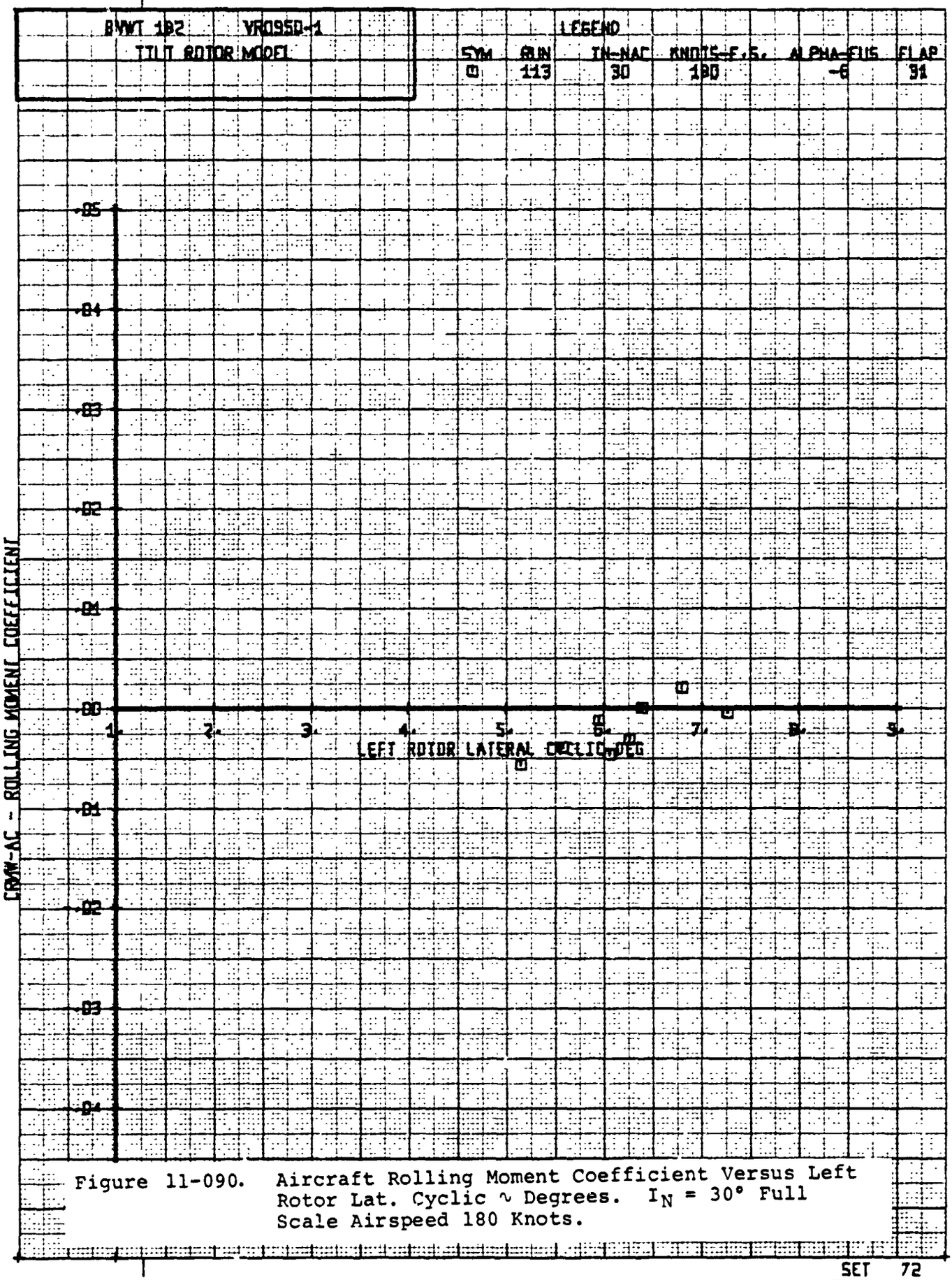


Figure 11-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

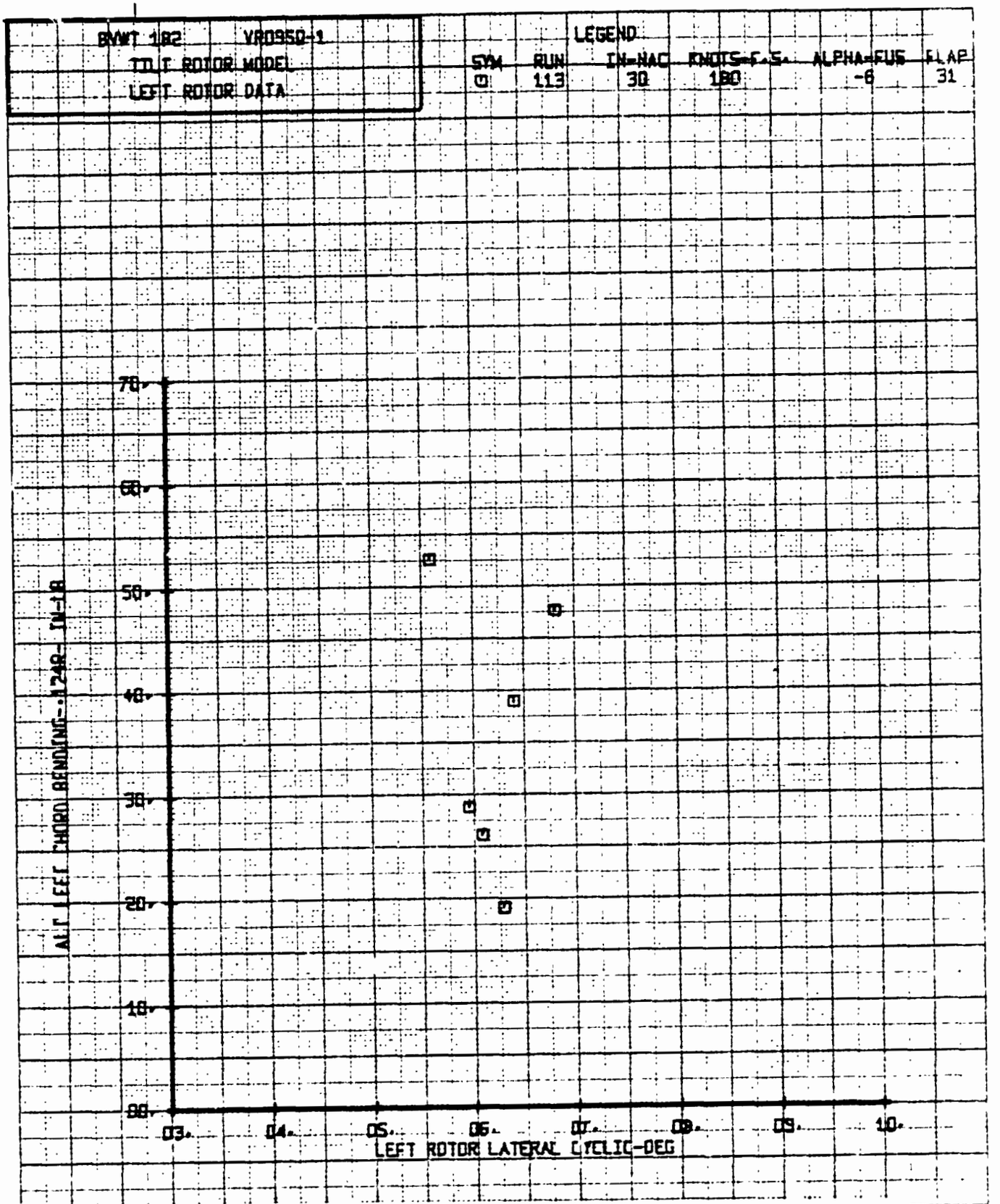


Figure 11-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 72
BWWT 182

SET 72
BWWT 182

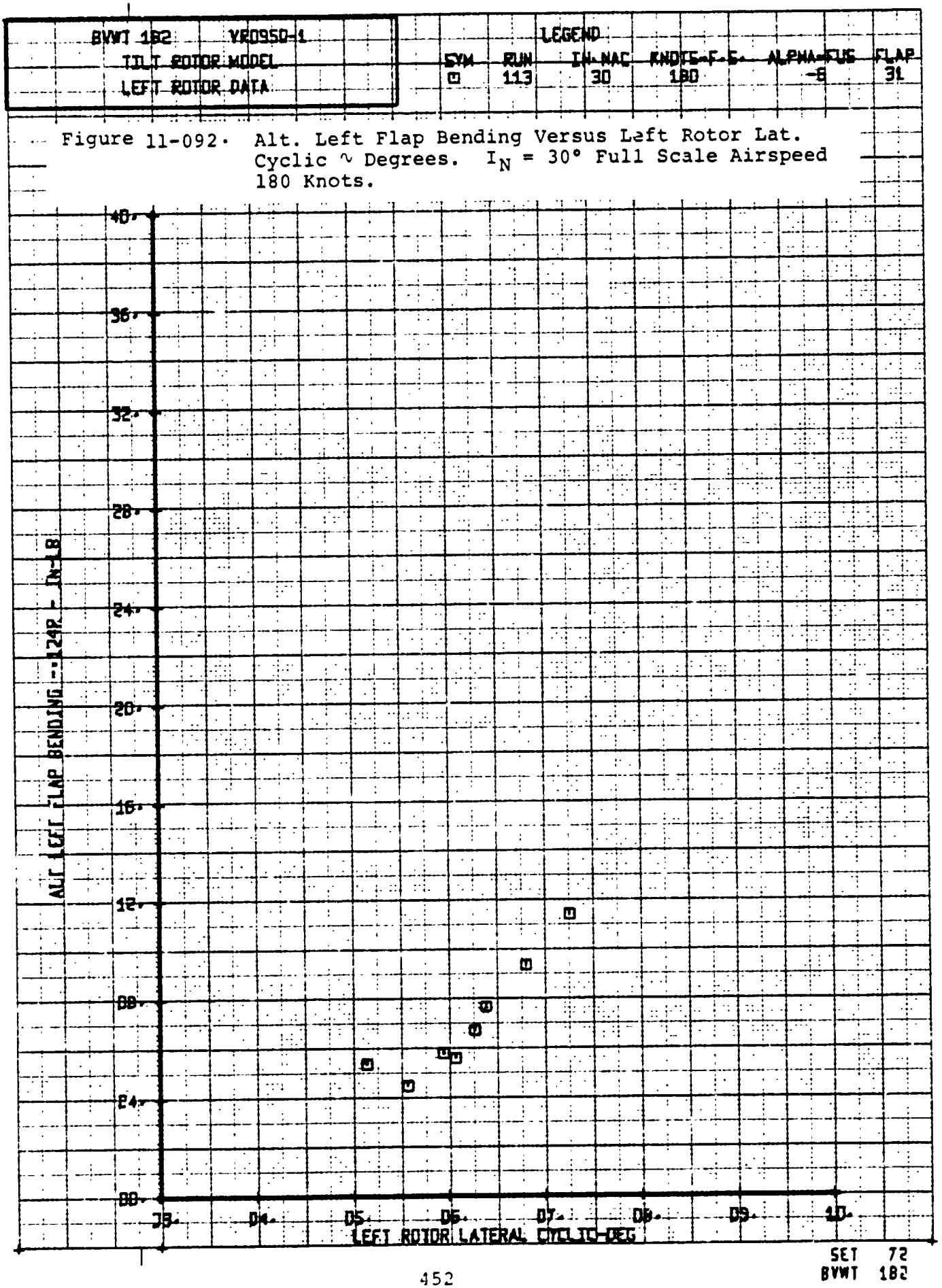


Figure 11-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

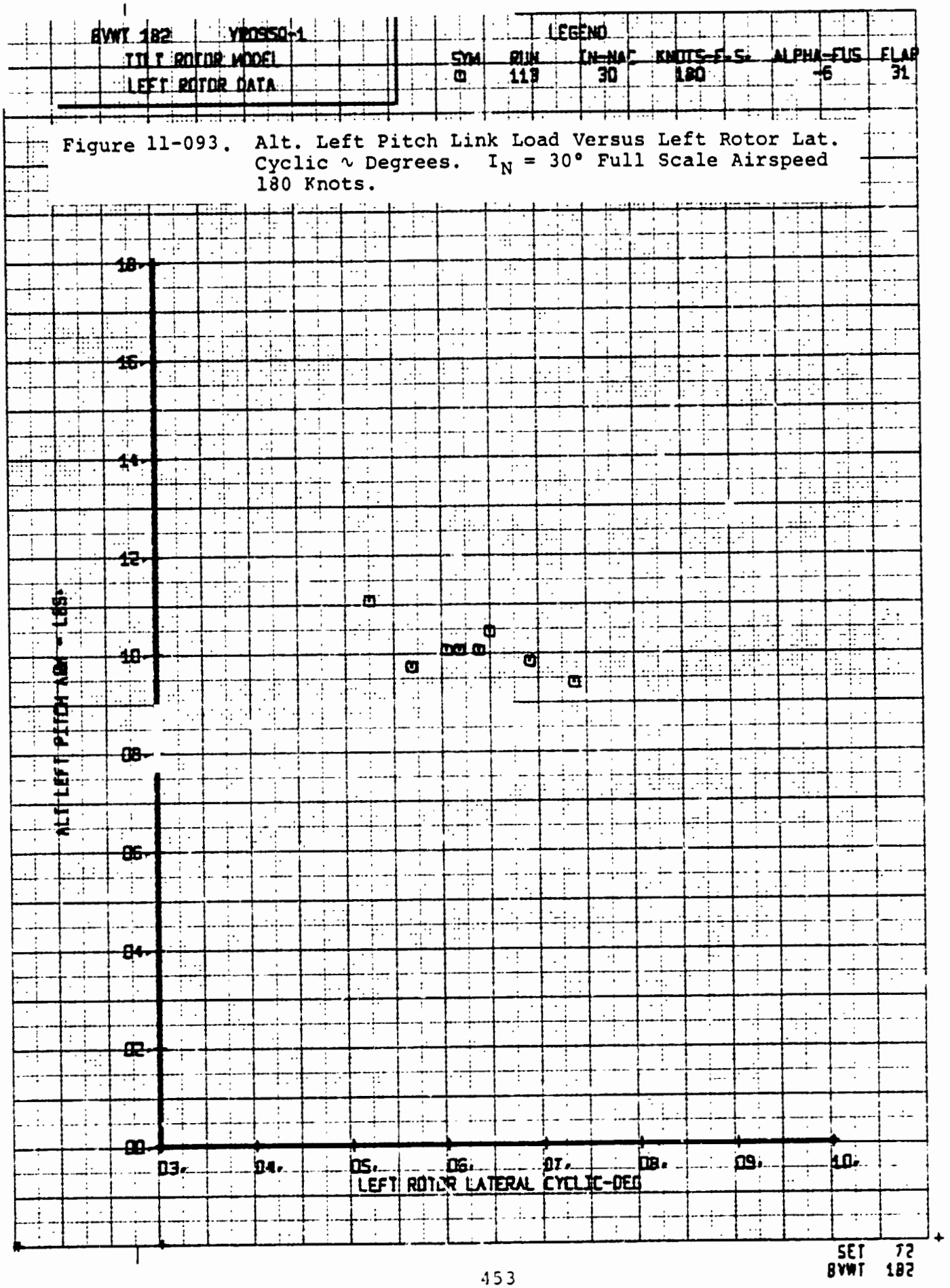


Figure 11-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

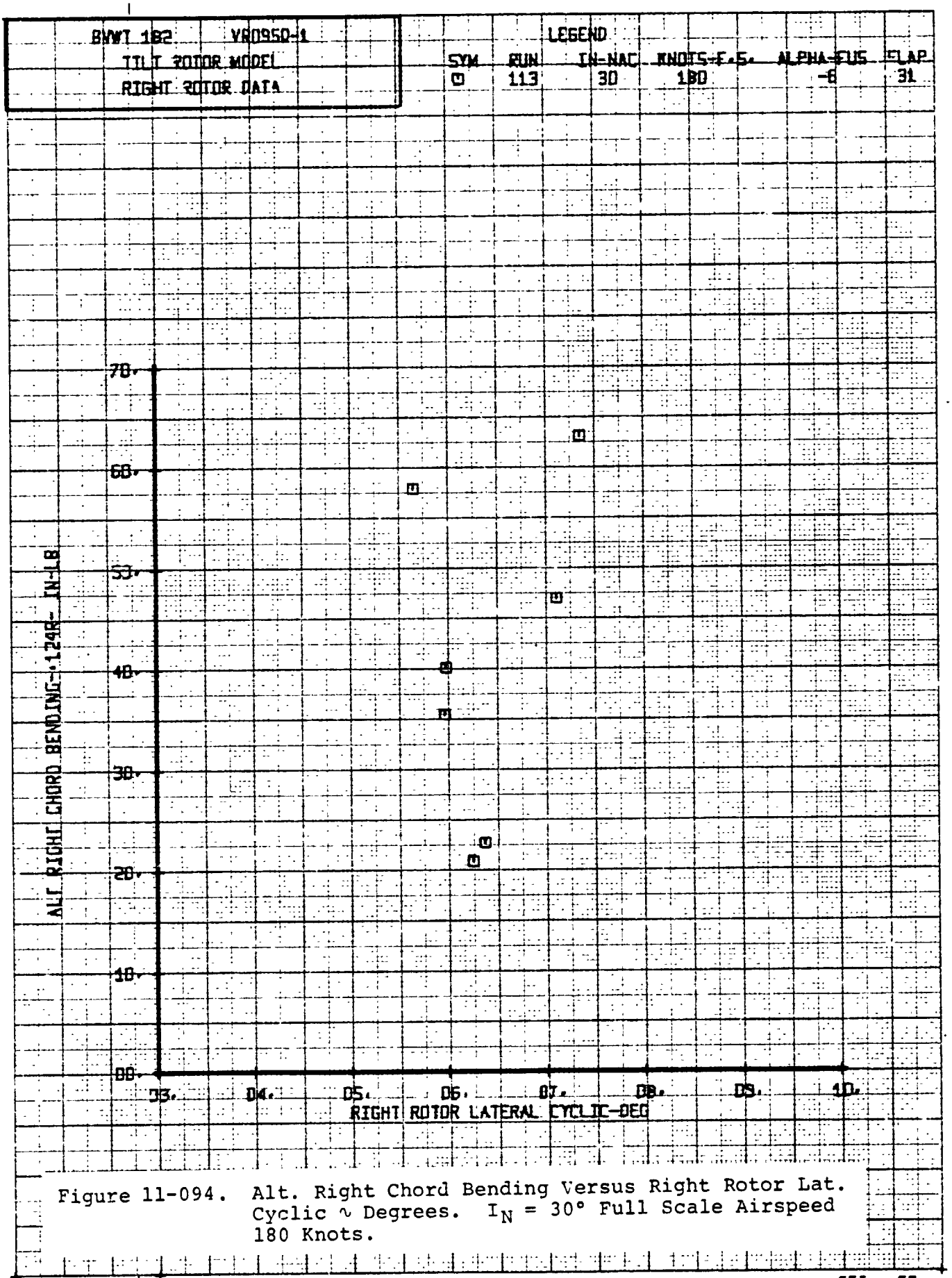


Figure 11-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 72
BWT 182

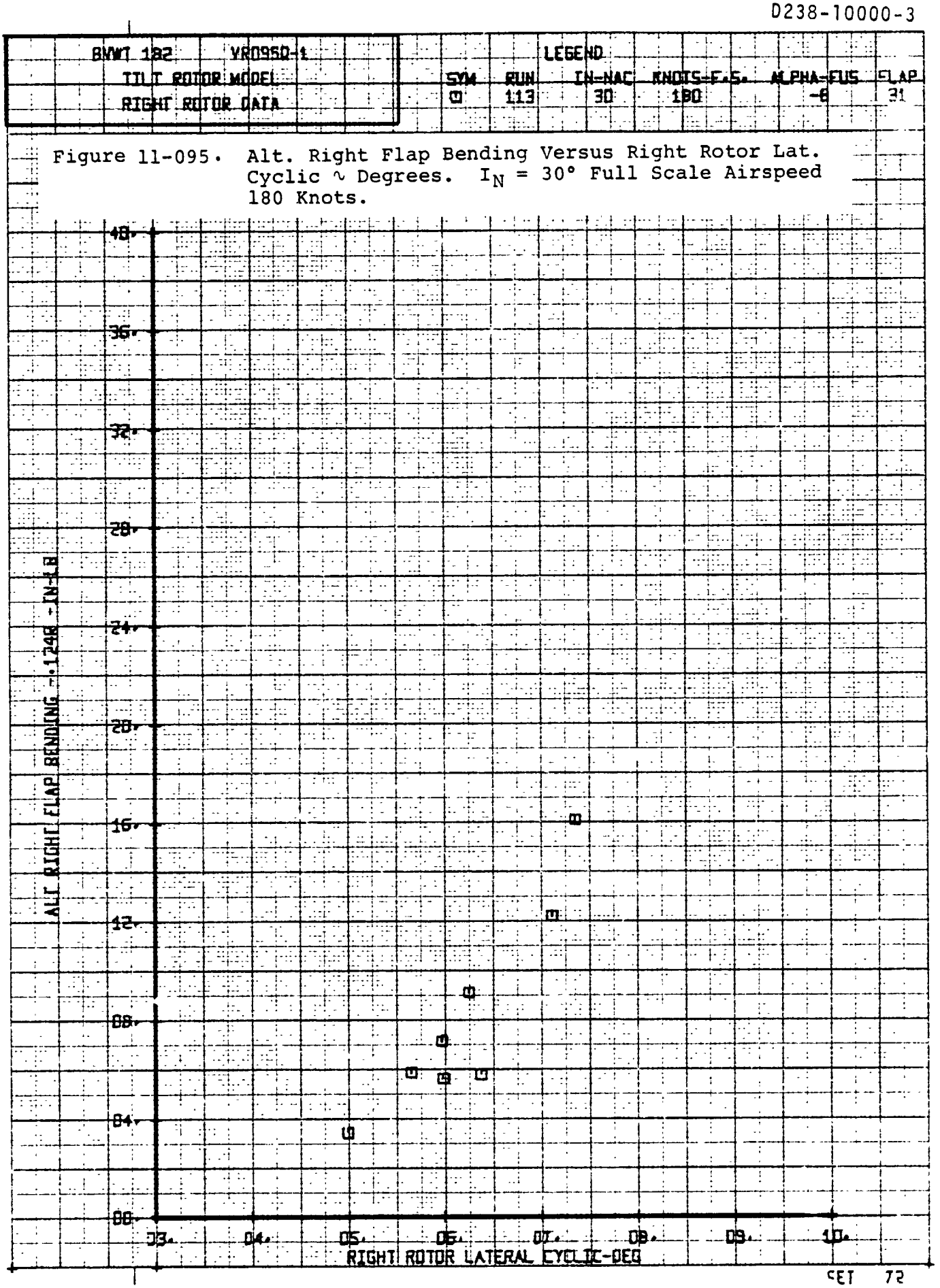


Figure 11-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

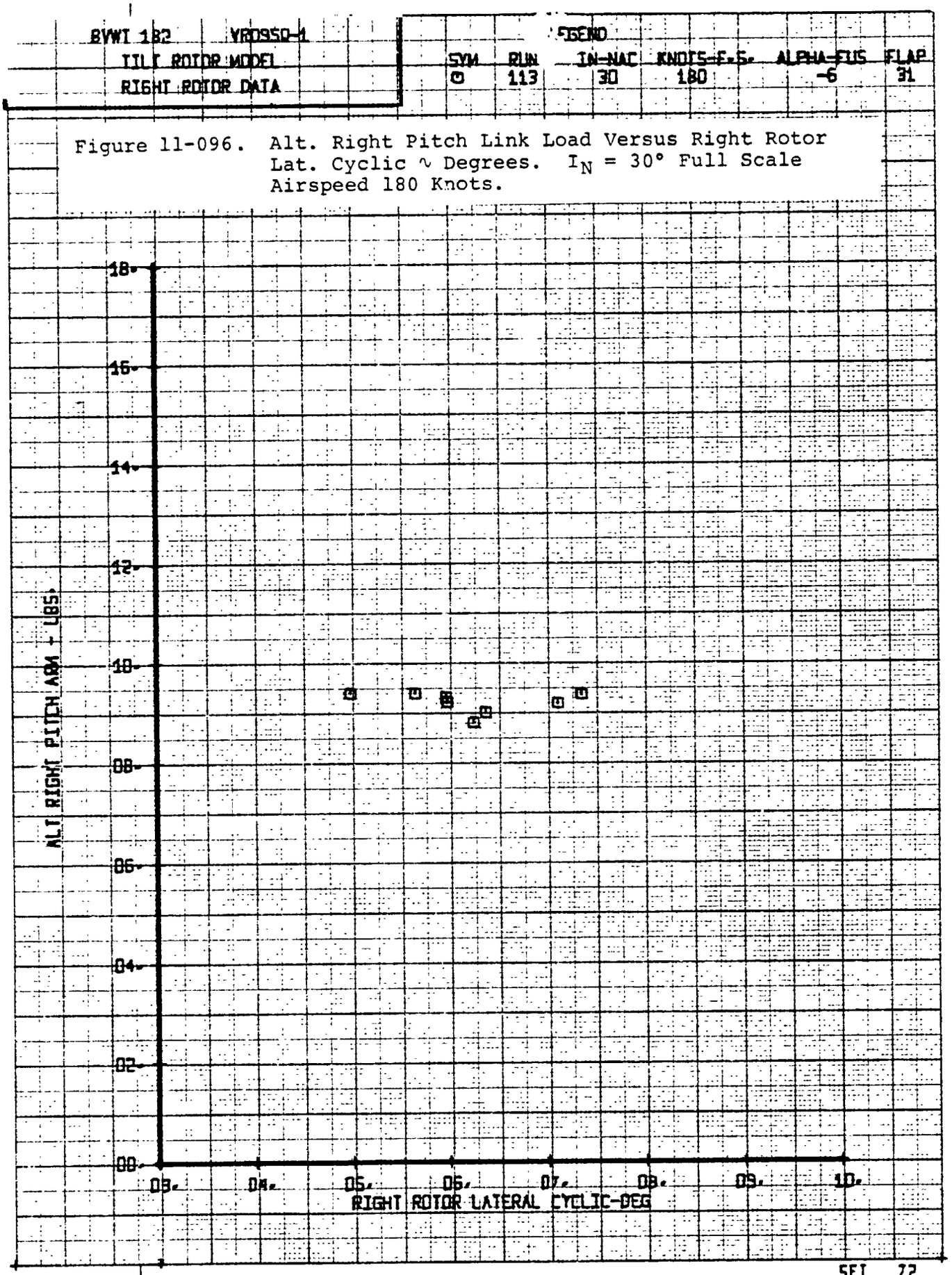


Figure 11-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

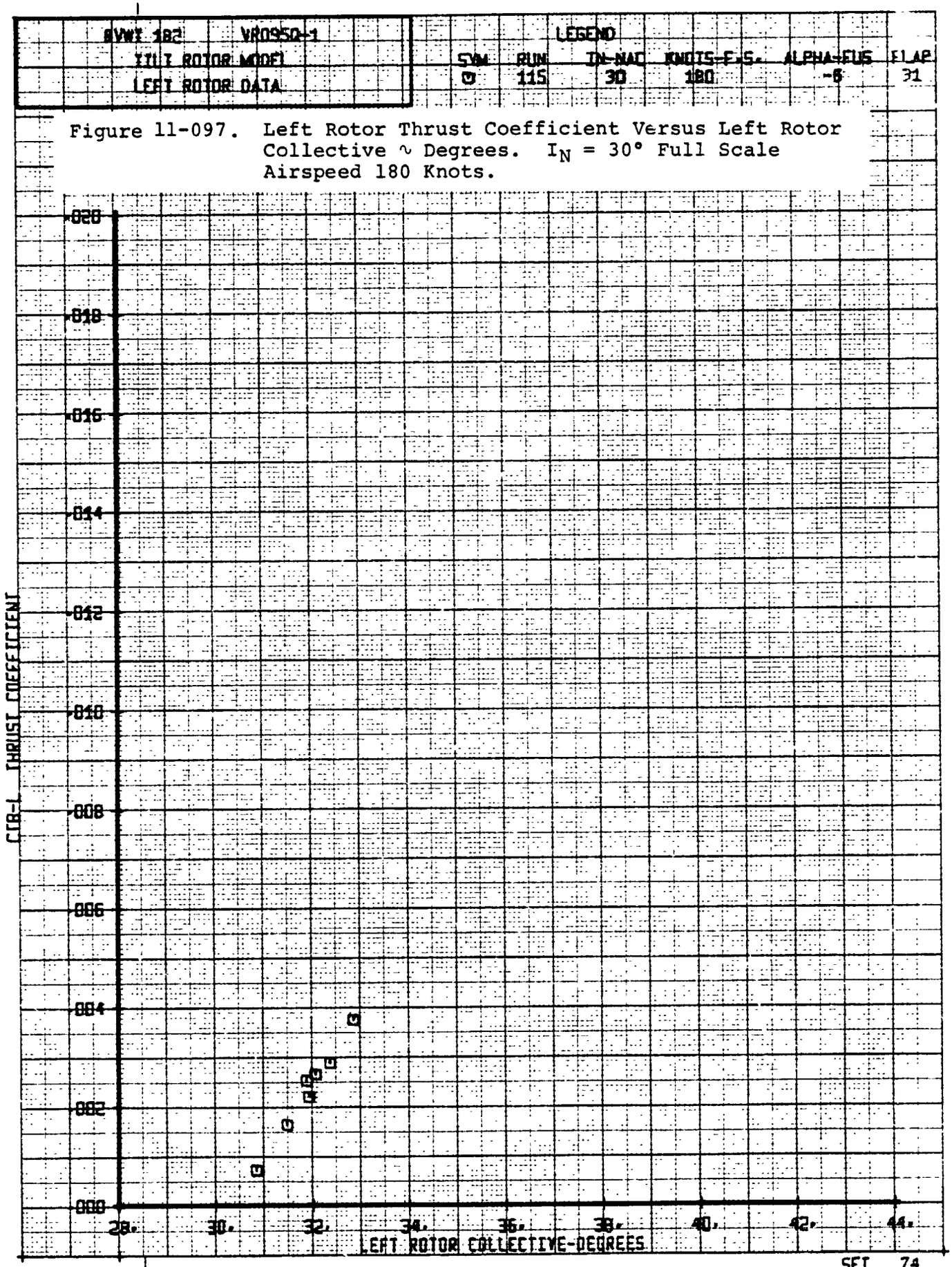


Figure 11-097. Left Rotor Thrust Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 74
BVWT 182

SET 74
BVWT 182

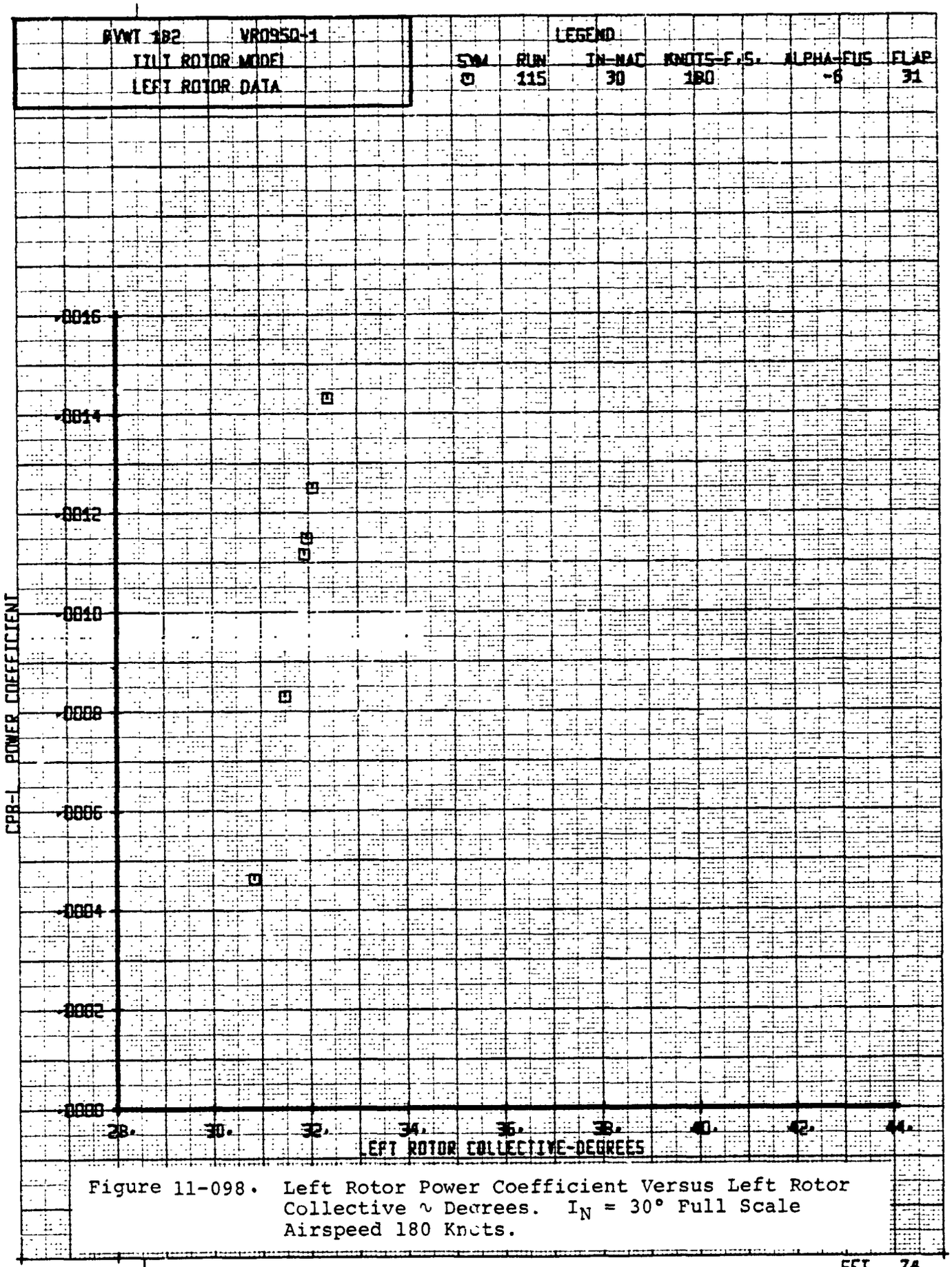


Figure 11-098. Left Rotor Power Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

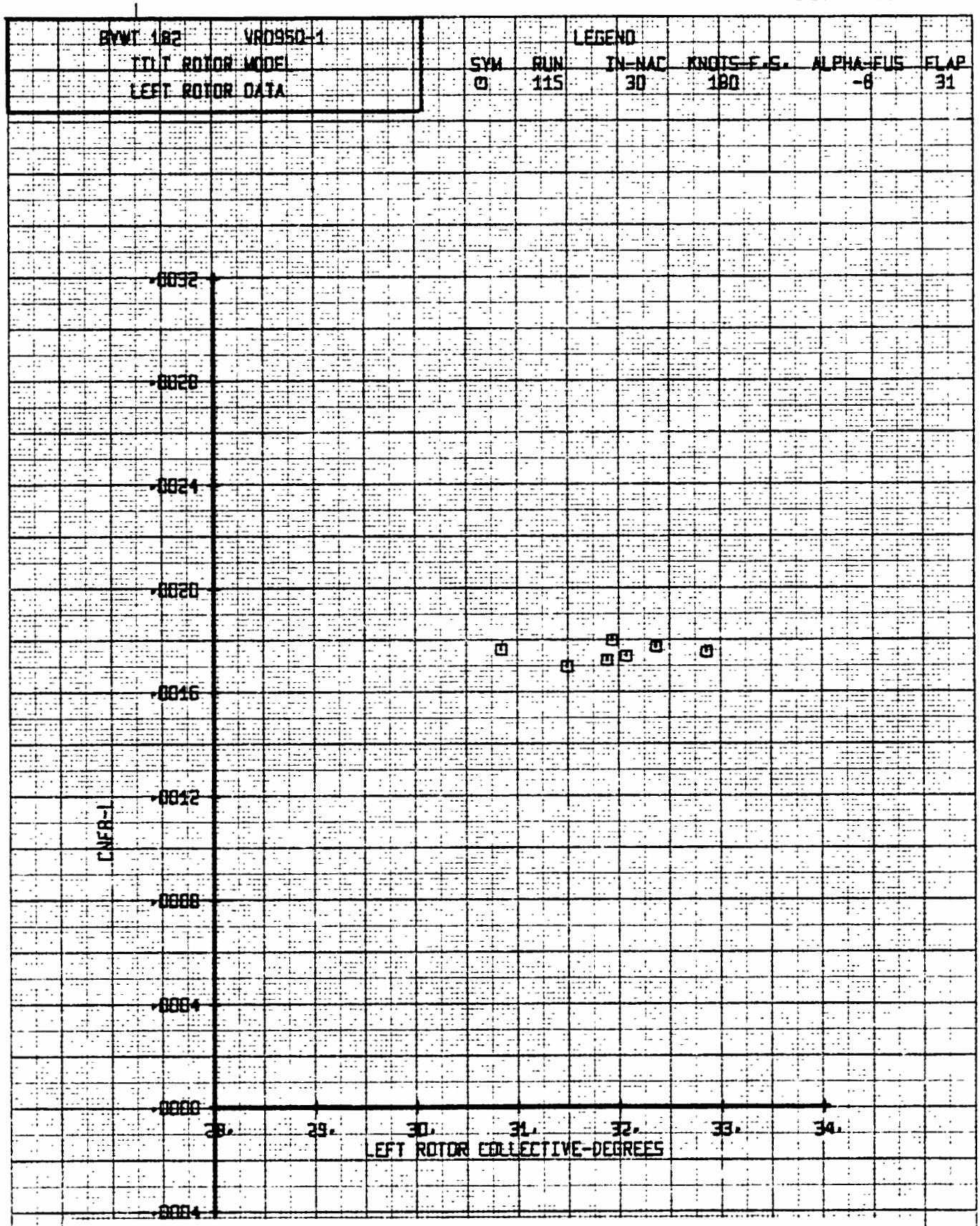


Figure 11-099. Left Rotor Normal Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

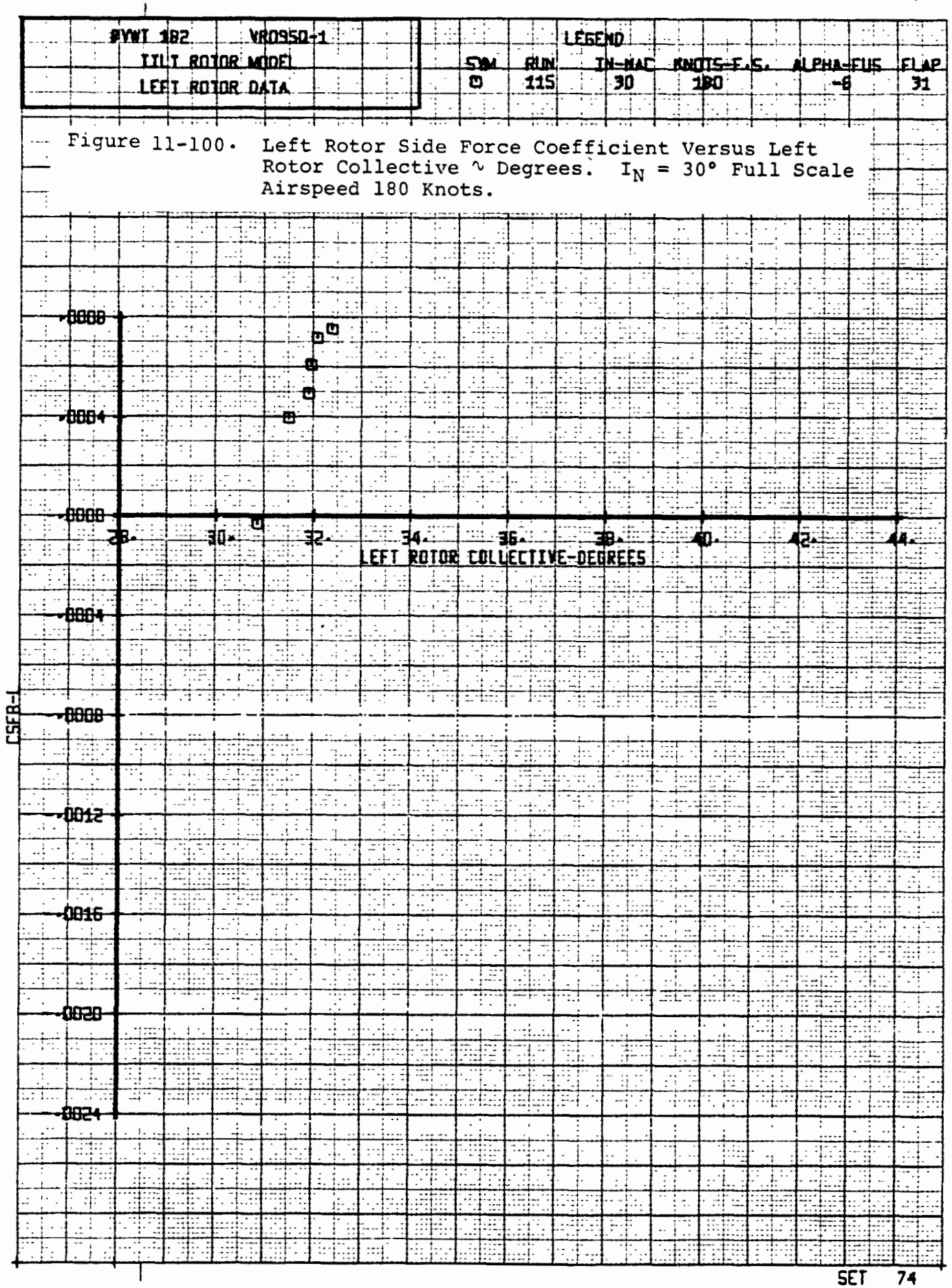


Figure 11-100. Left Rotor Side Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

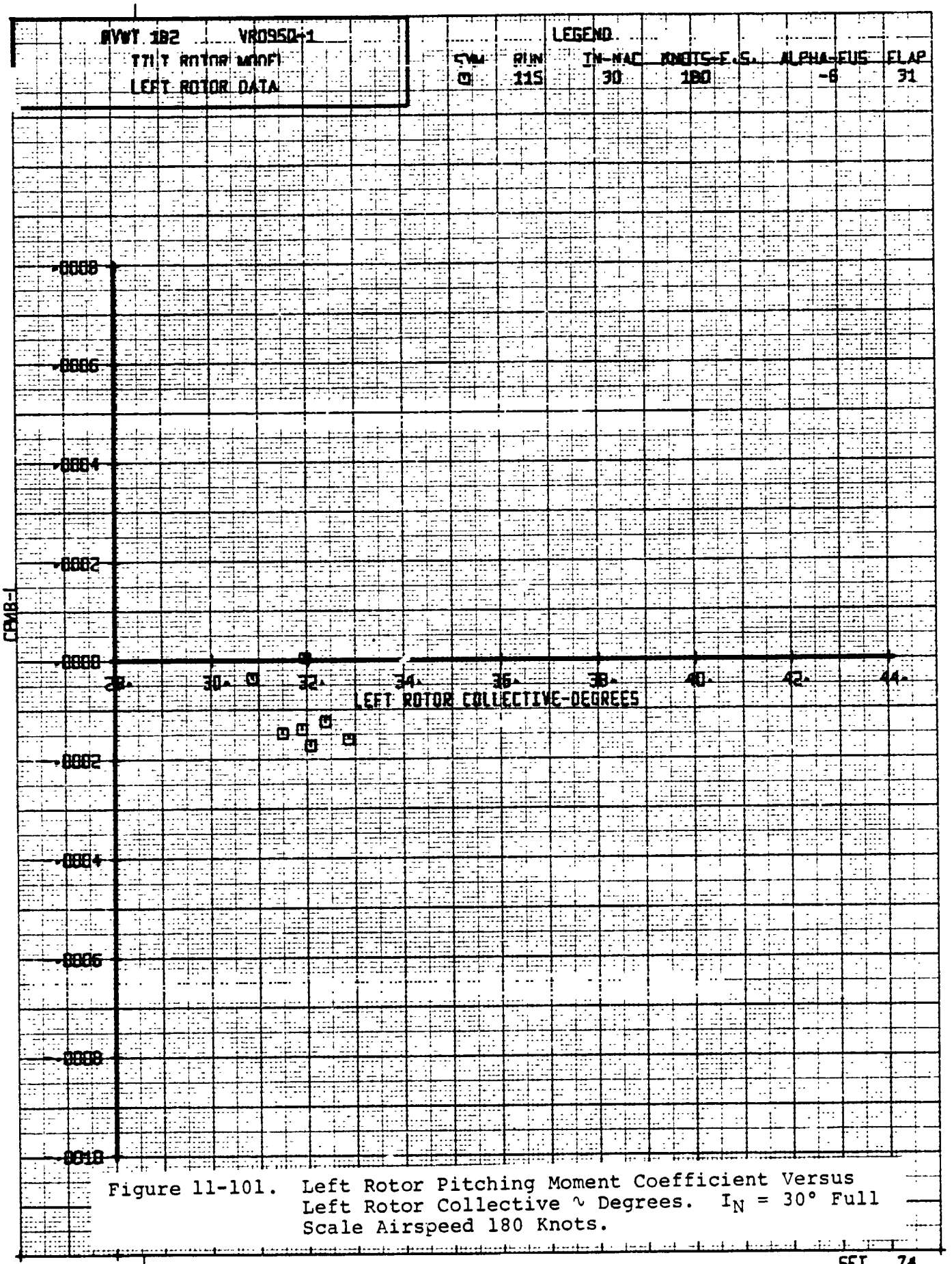


Figure 11-101. Left Rotor Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

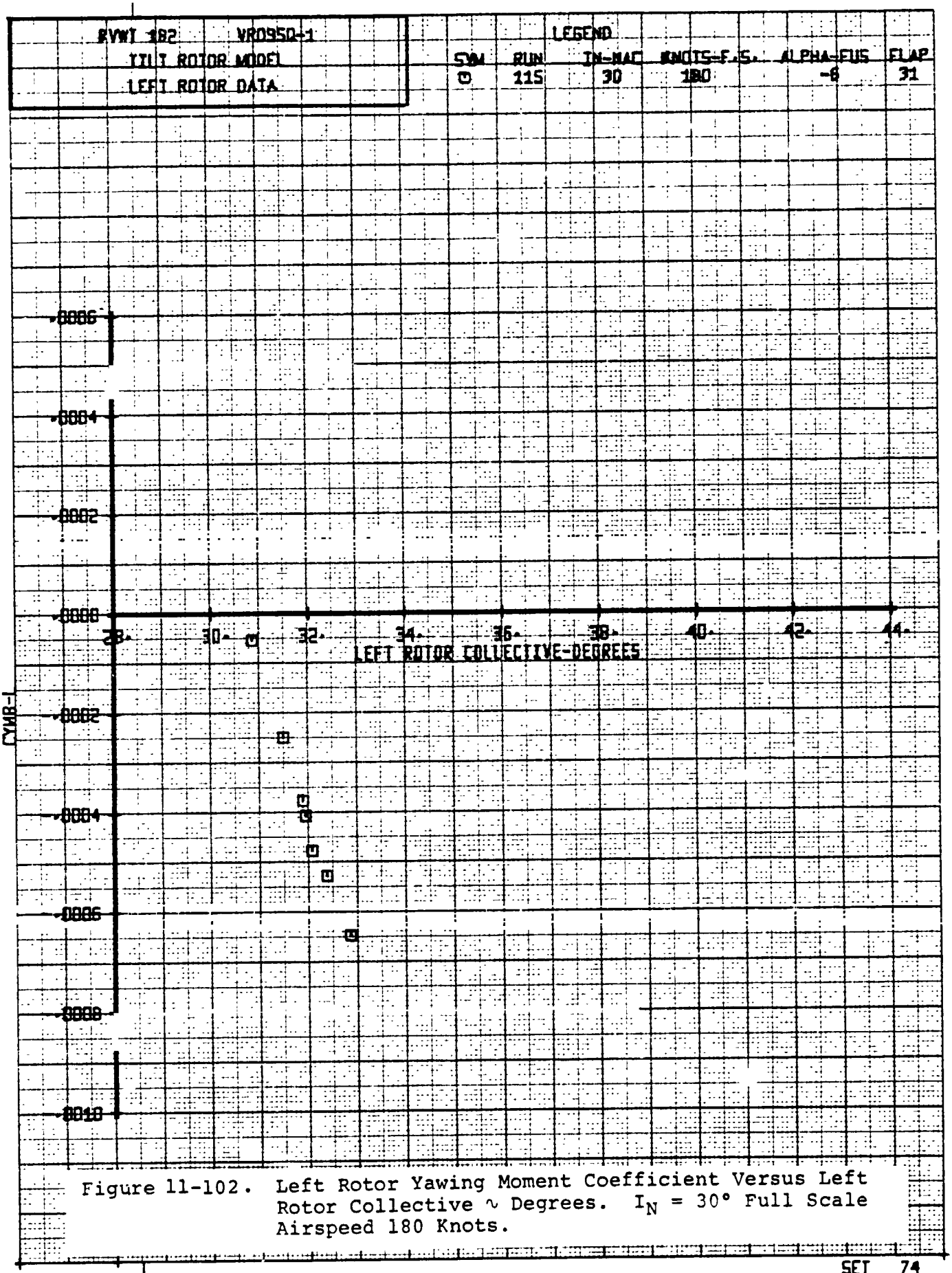


Figure 11-102. Left Rotor Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

74
182

SET 74
BVWT 182

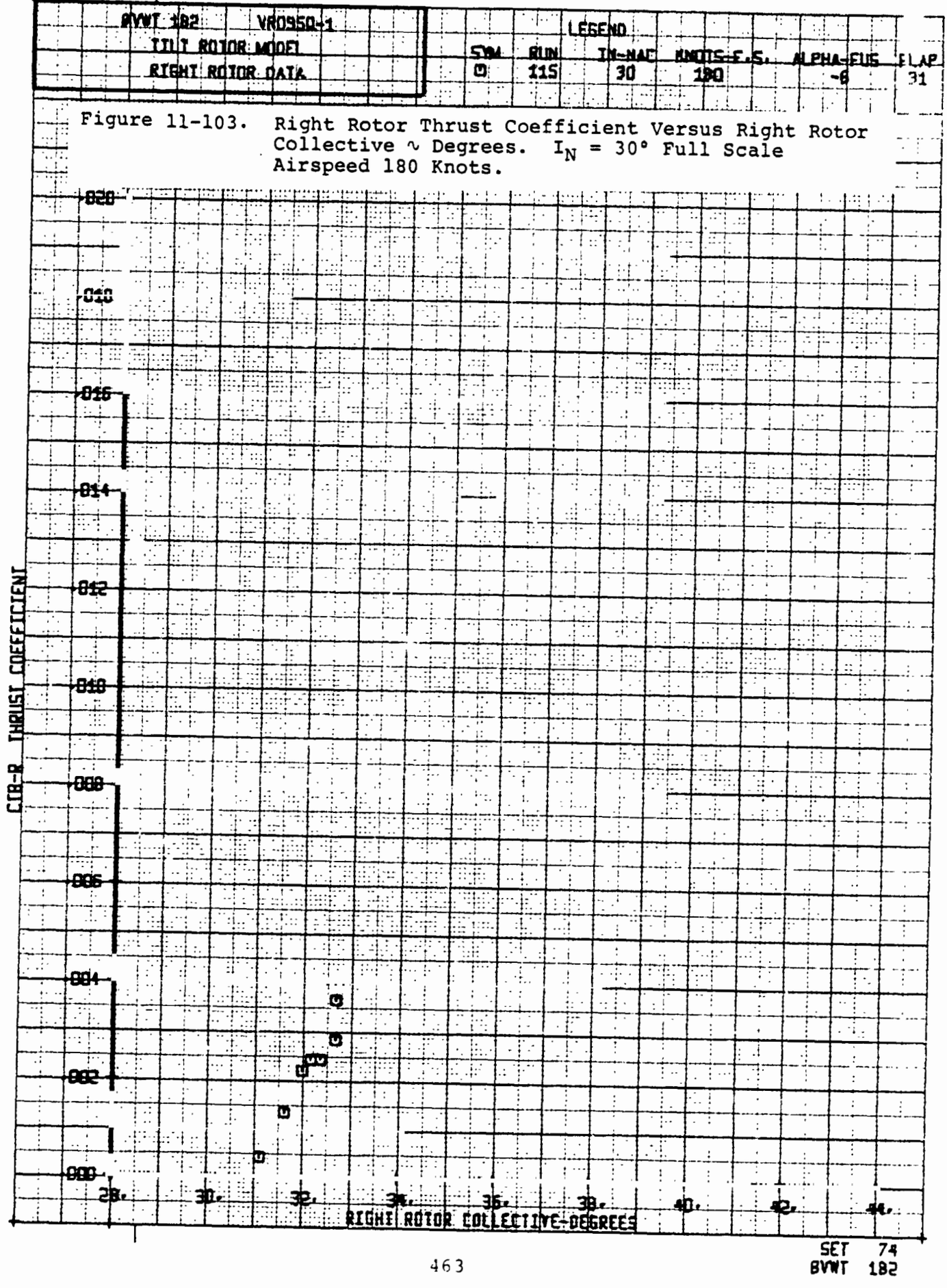


Figure 11-103. Right Rotor Thrust Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

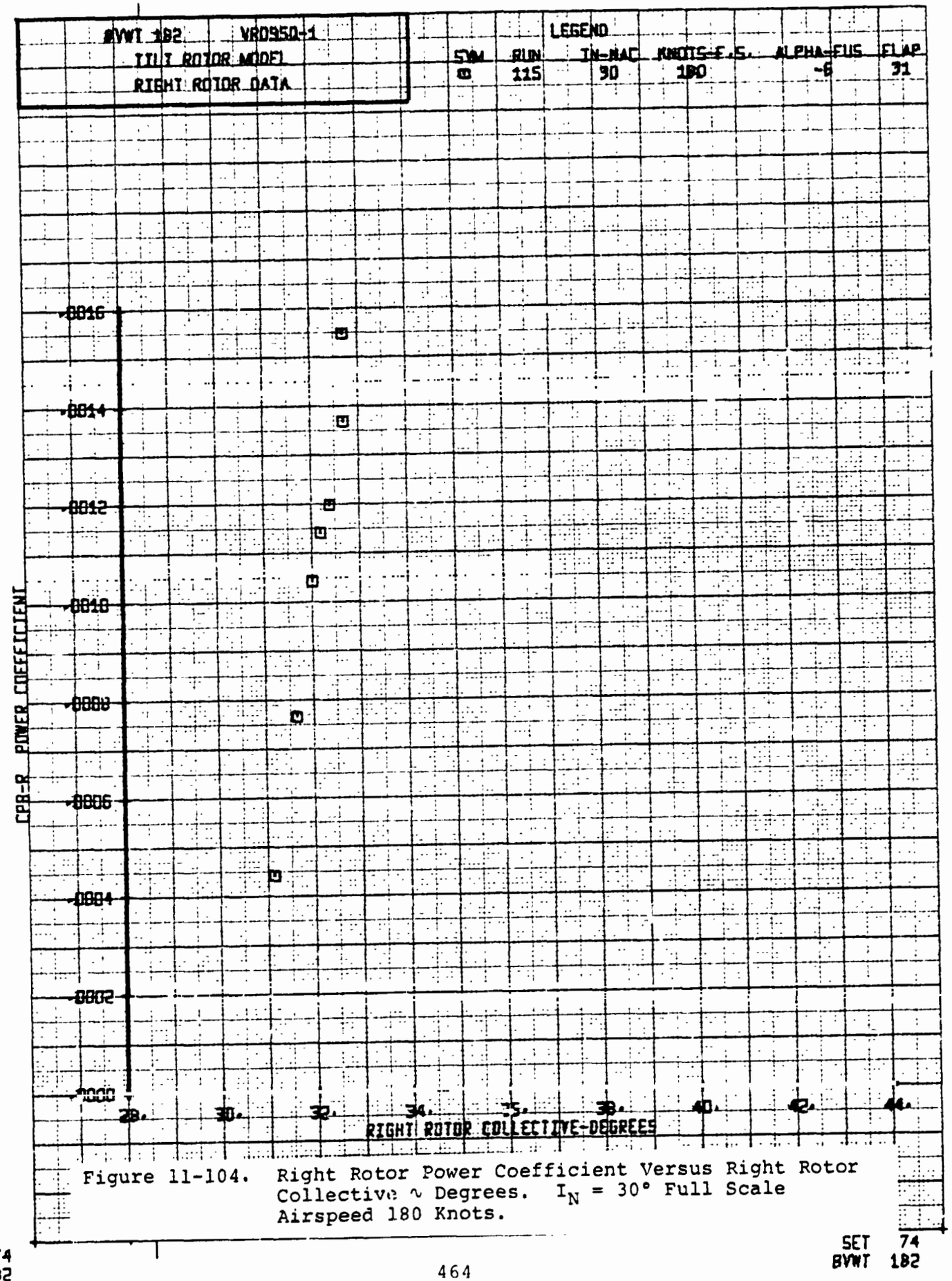


Figure 11-104. Right Rotor Power Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

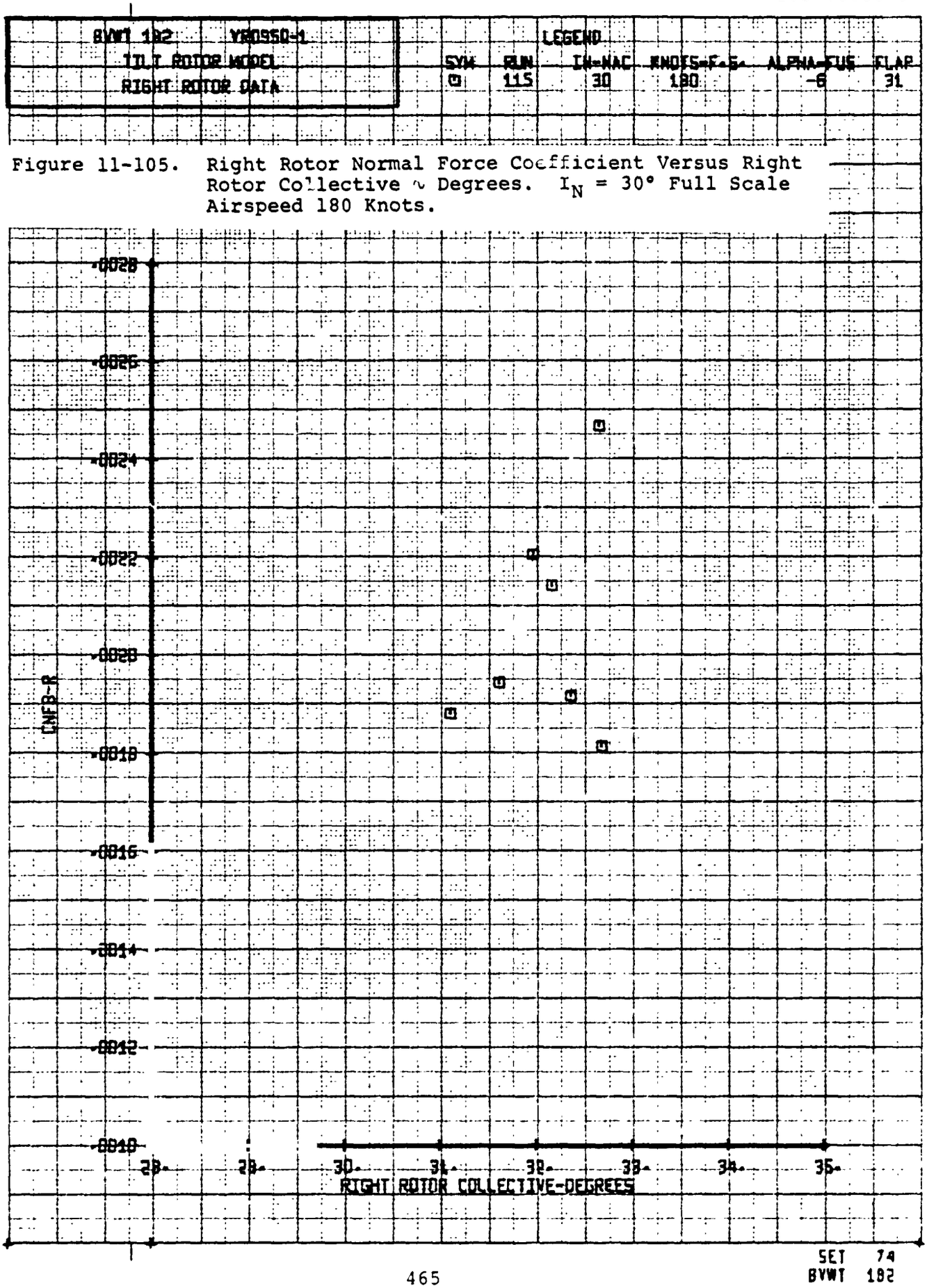


Figure 11-105. Right Rotor Normal Force Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

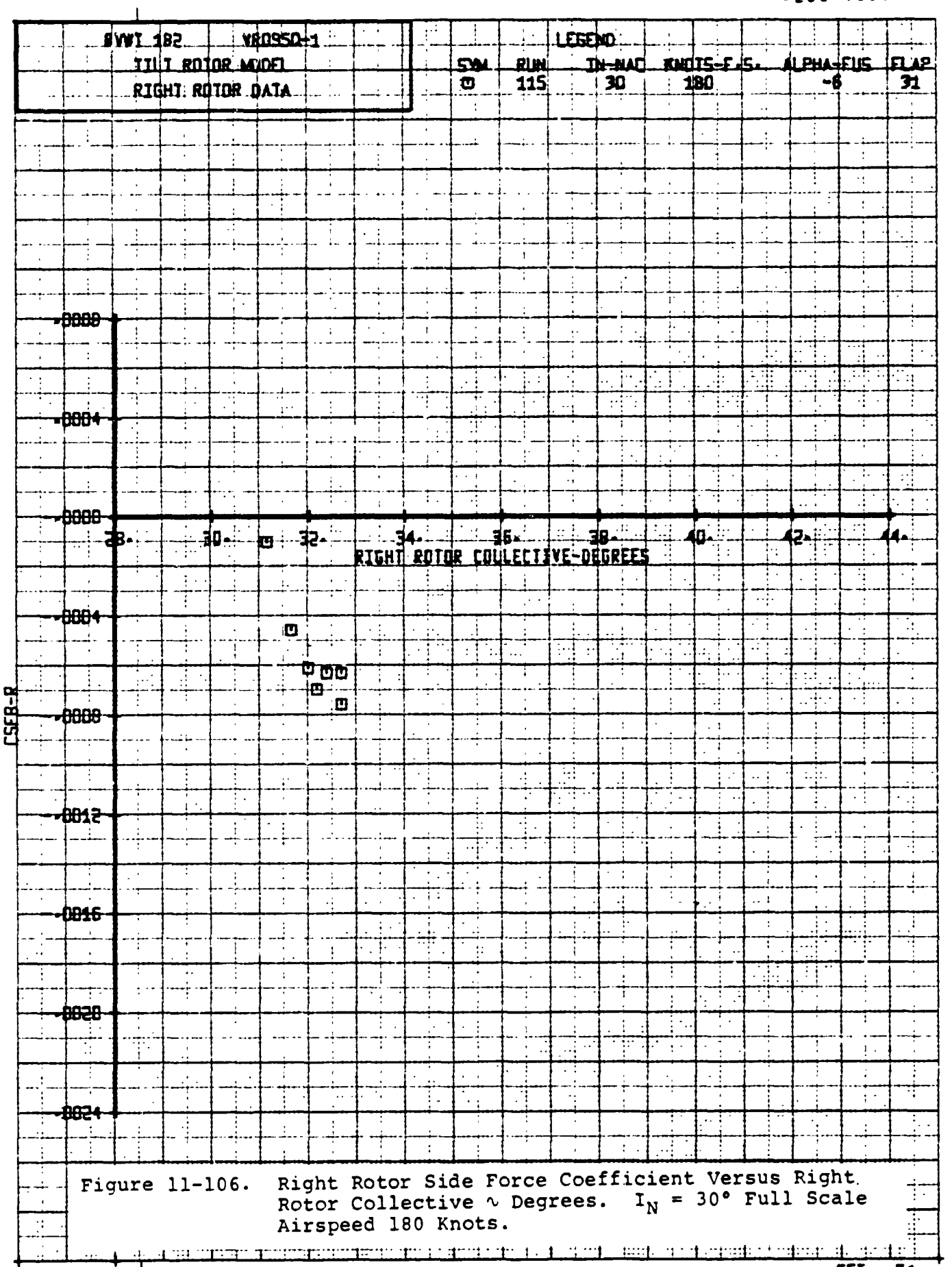


Figure 11-106. Right Rotor Side Force Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

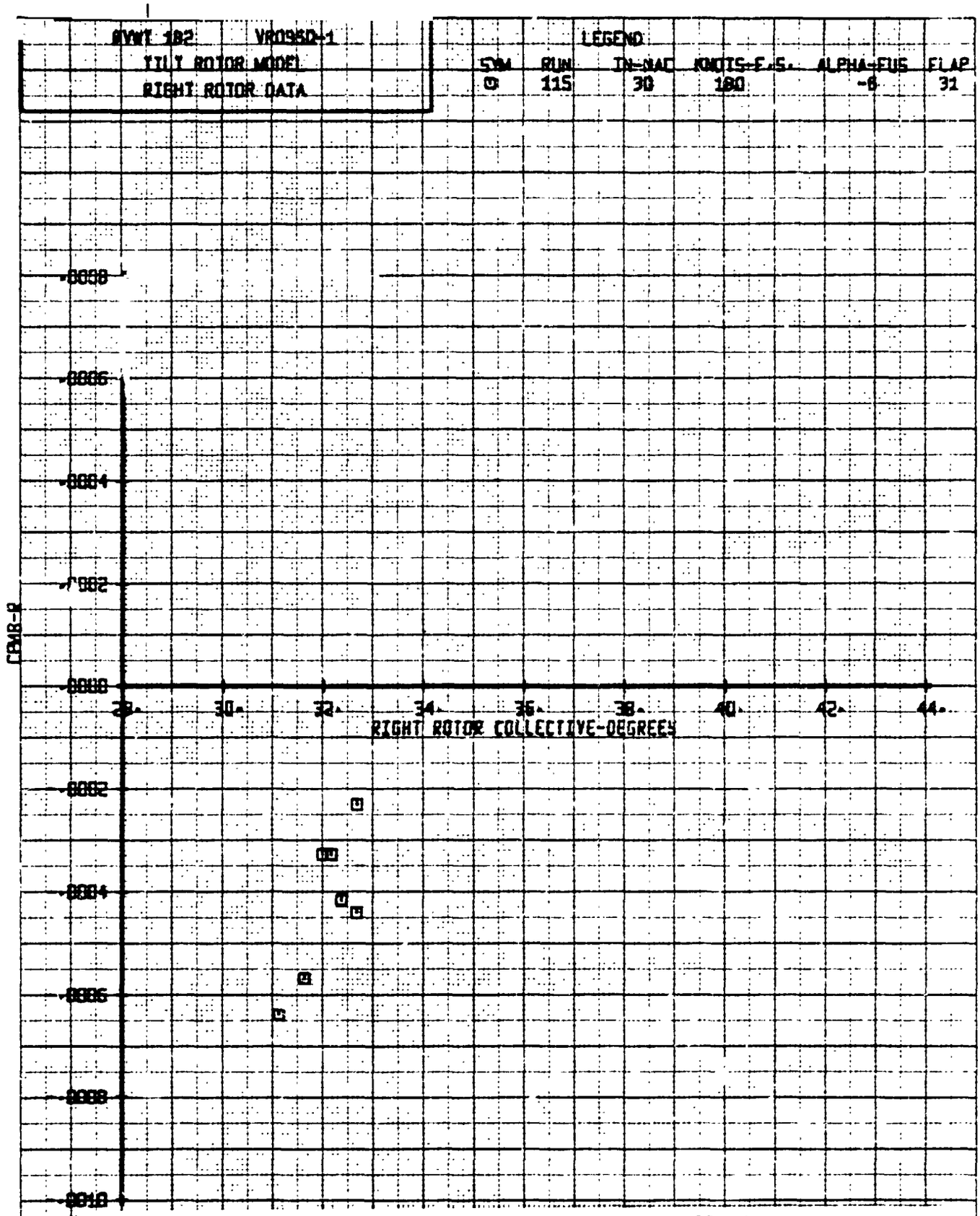


Figure 11-107. Right Rotor Pitching Moment Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

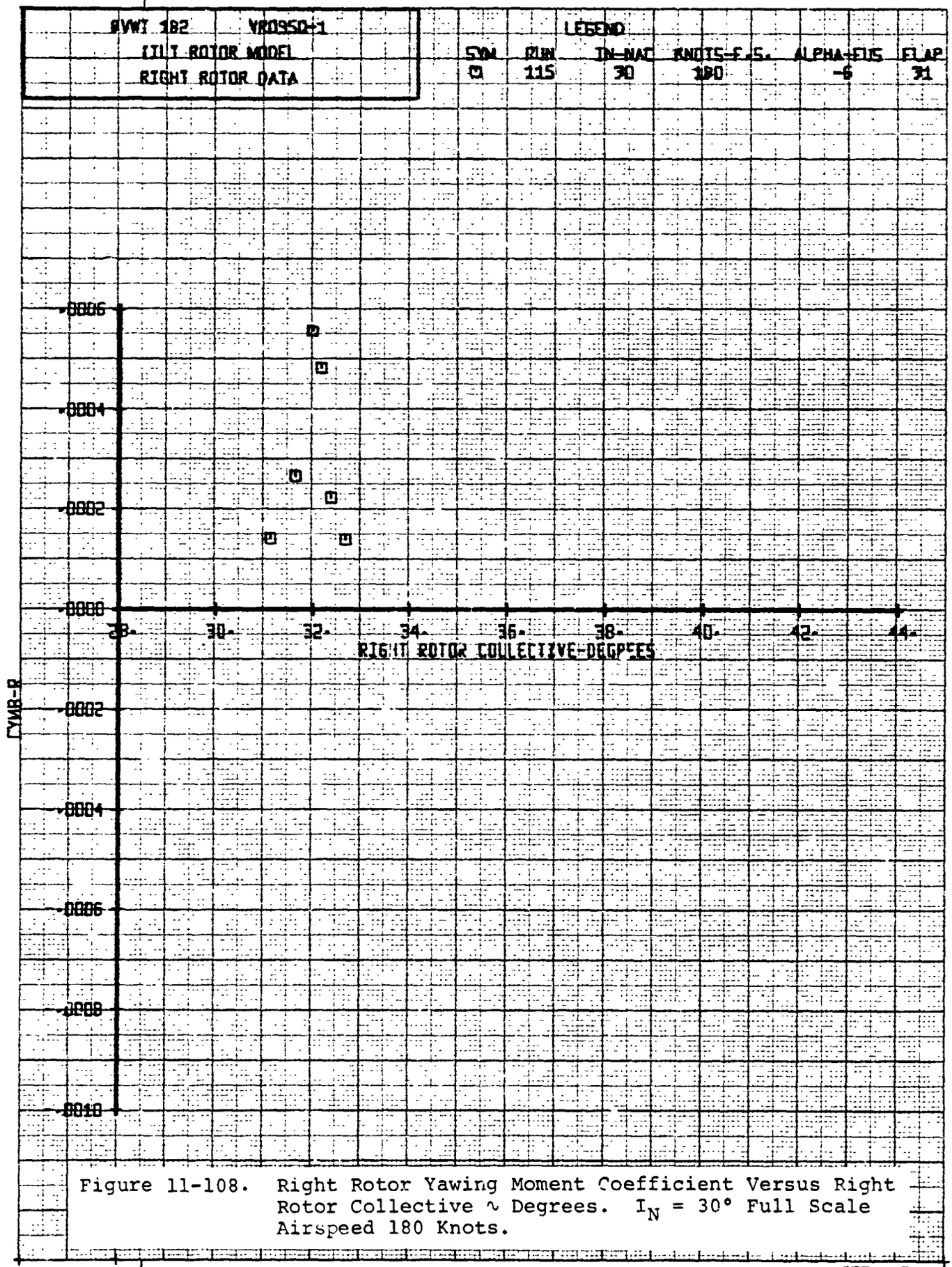


Figure 11-108. Right Rotor Yawing Moment Coefficient Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

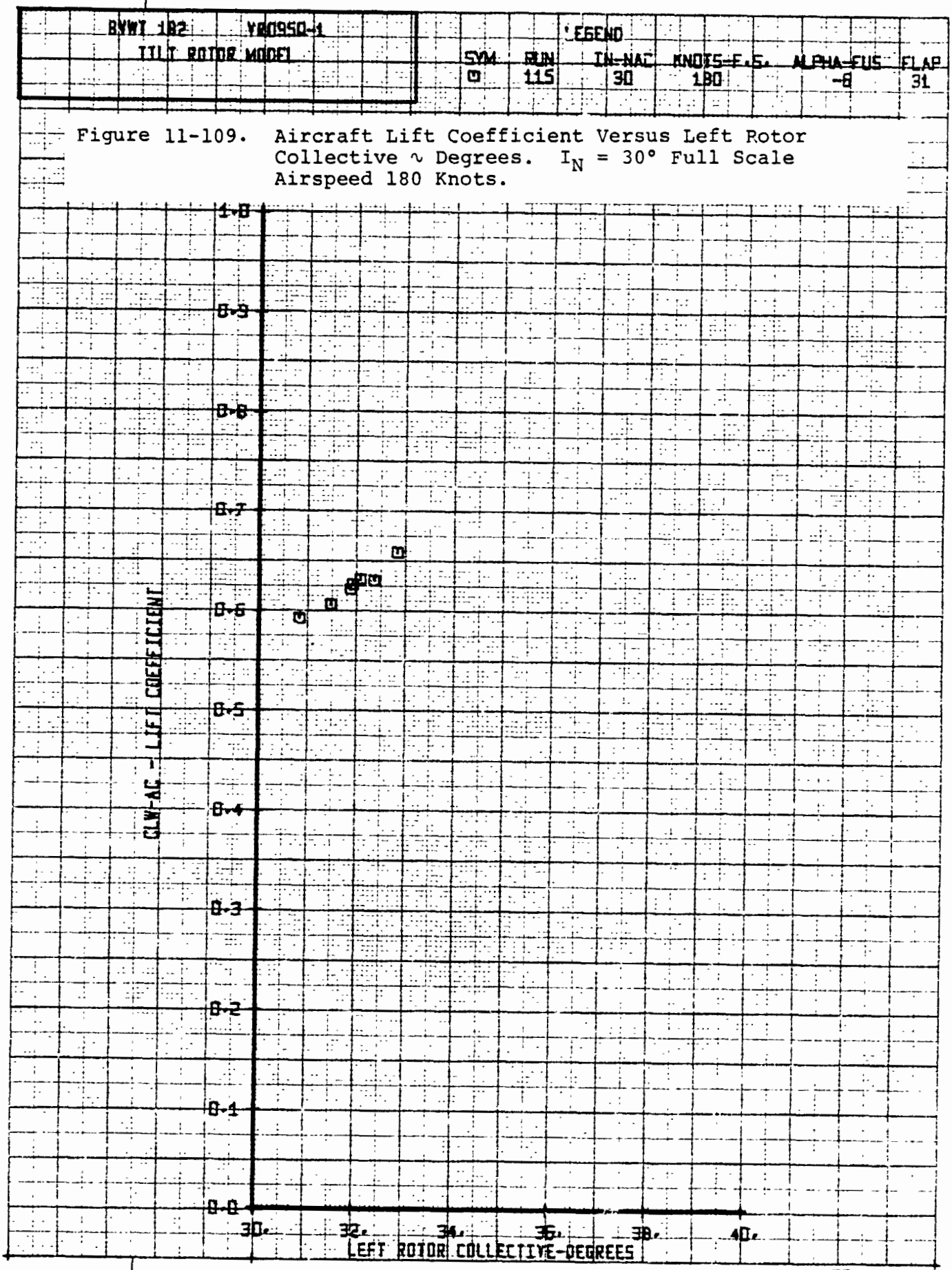


Figure 11-109. Aircraft Lift Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 74
182

SET 74
BVWT 182

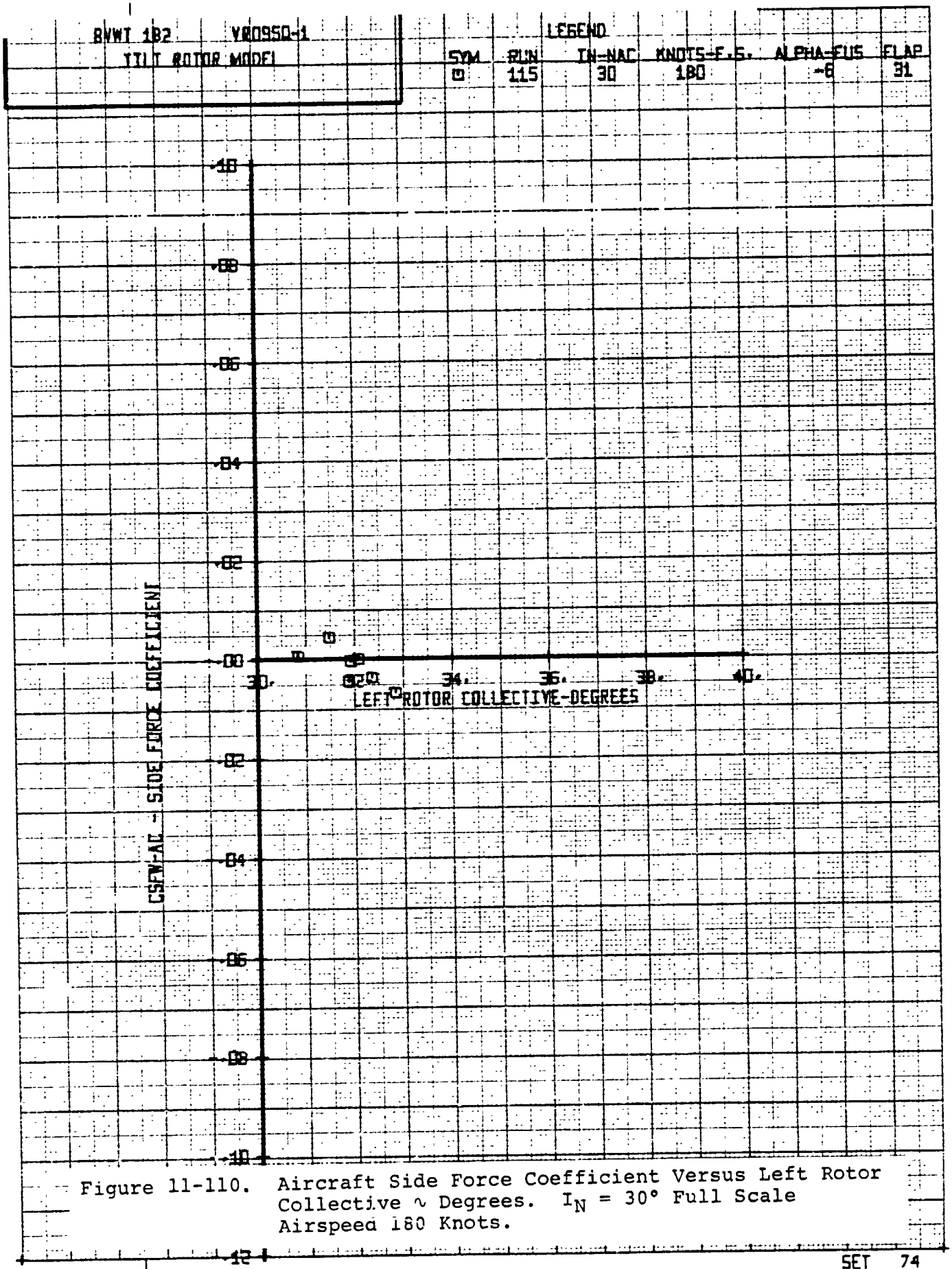


Figure 11-110. Aircraft Side Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

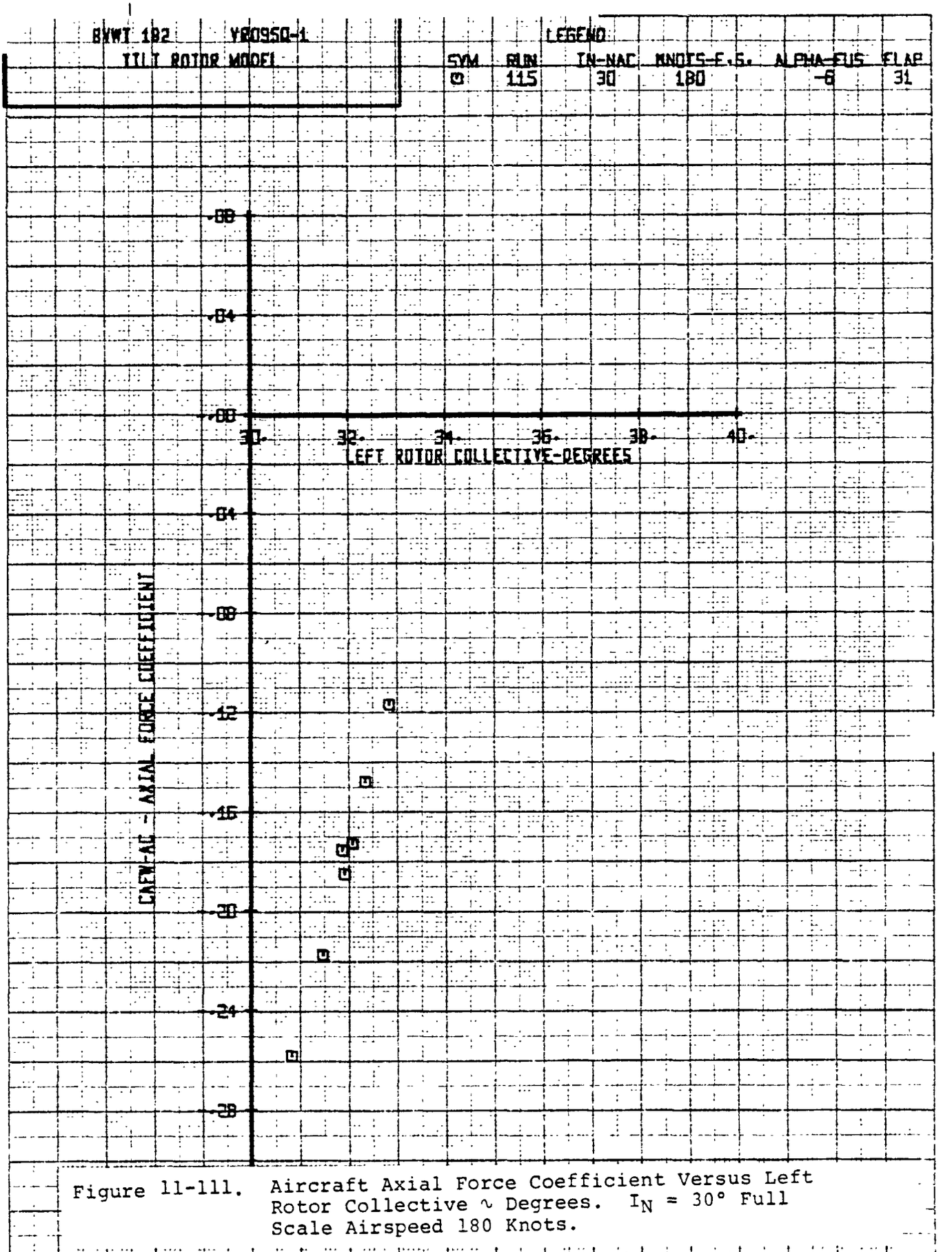


Figure 11-111. Aircraft Axial Force Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 74
V 182

SET 74
BVWT 182

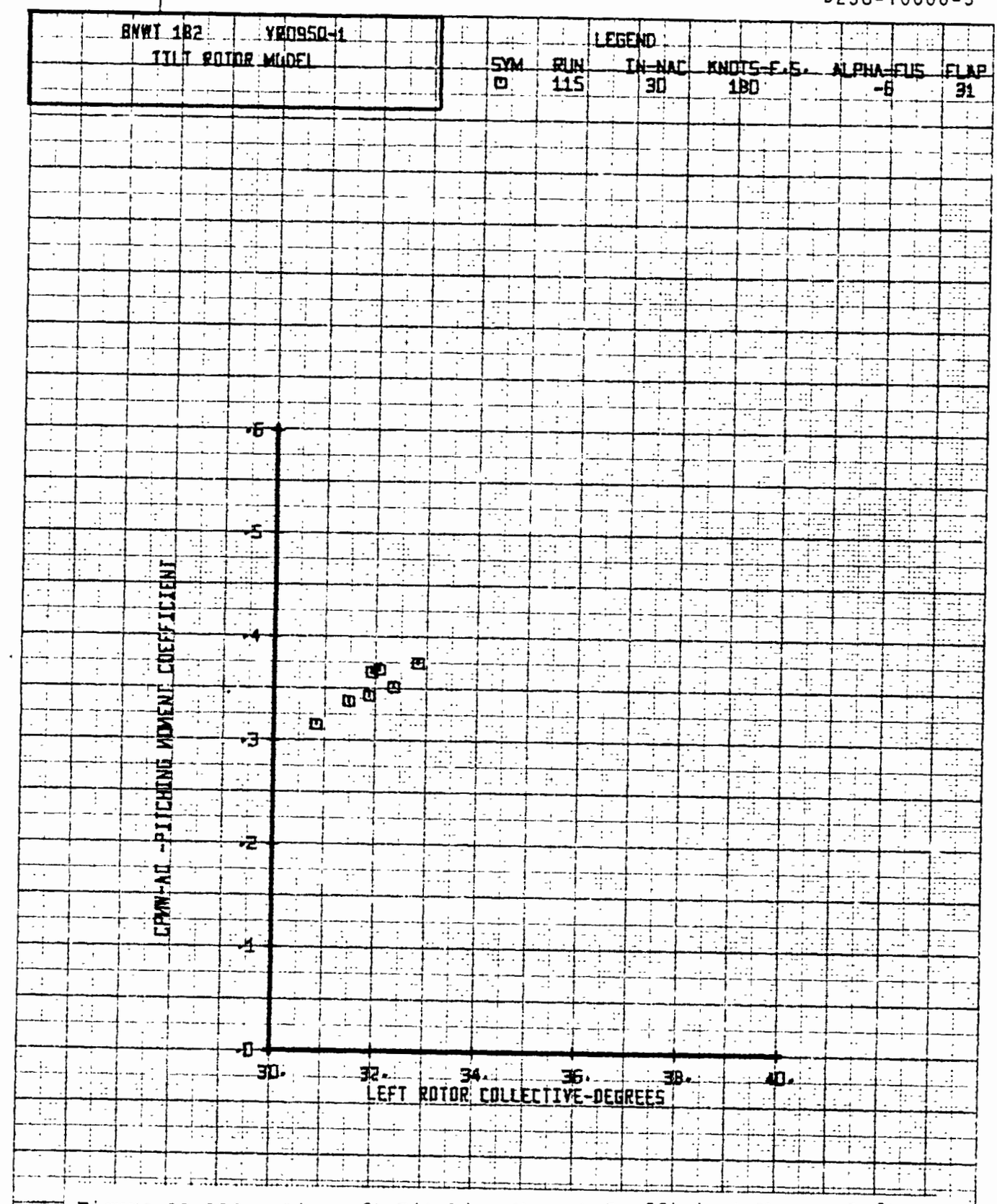


Figure 11-112. Aircraft Pitching Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

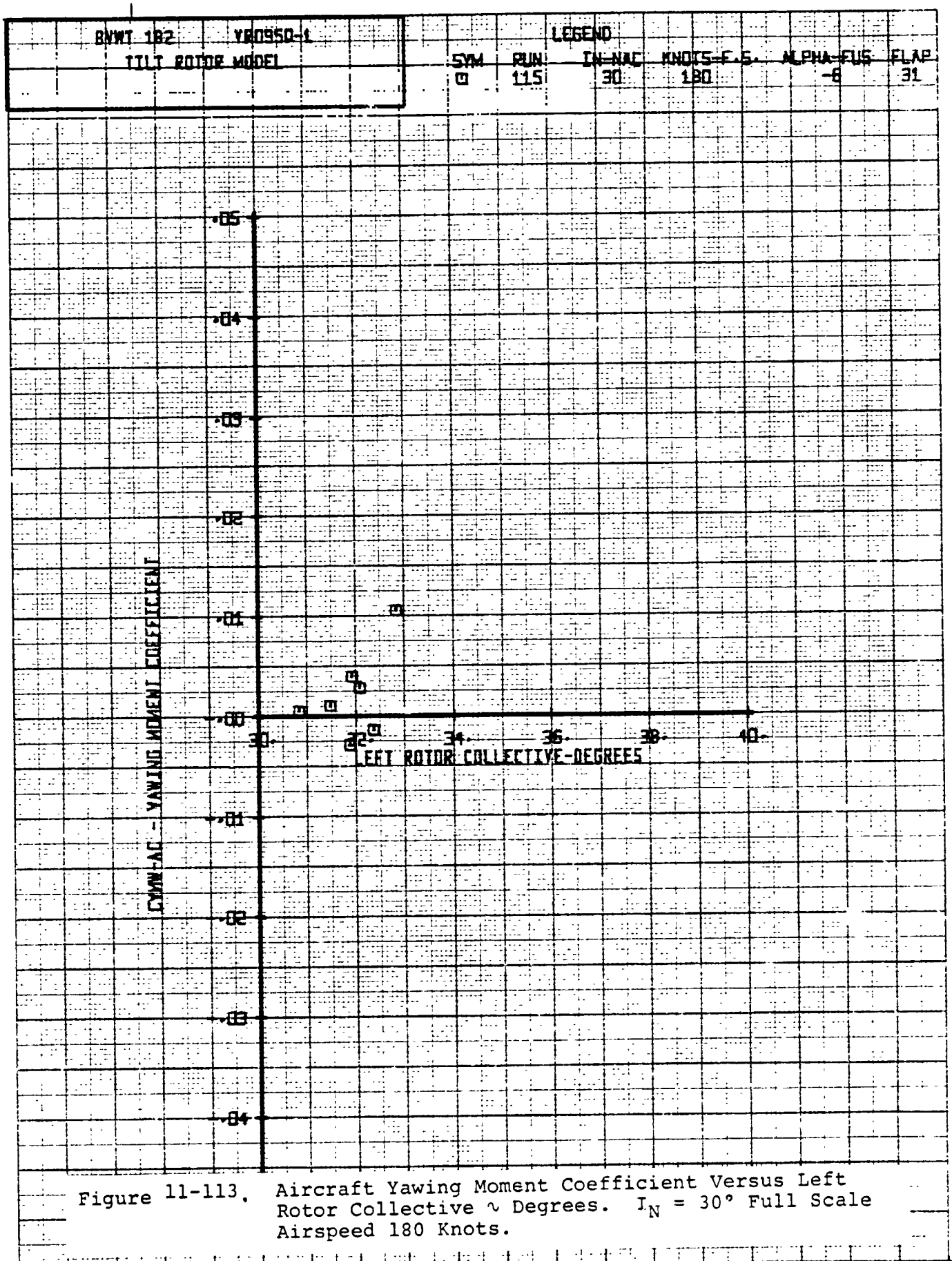


Figure 11-113. Aircraft Yawing Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 74
BVWT 182

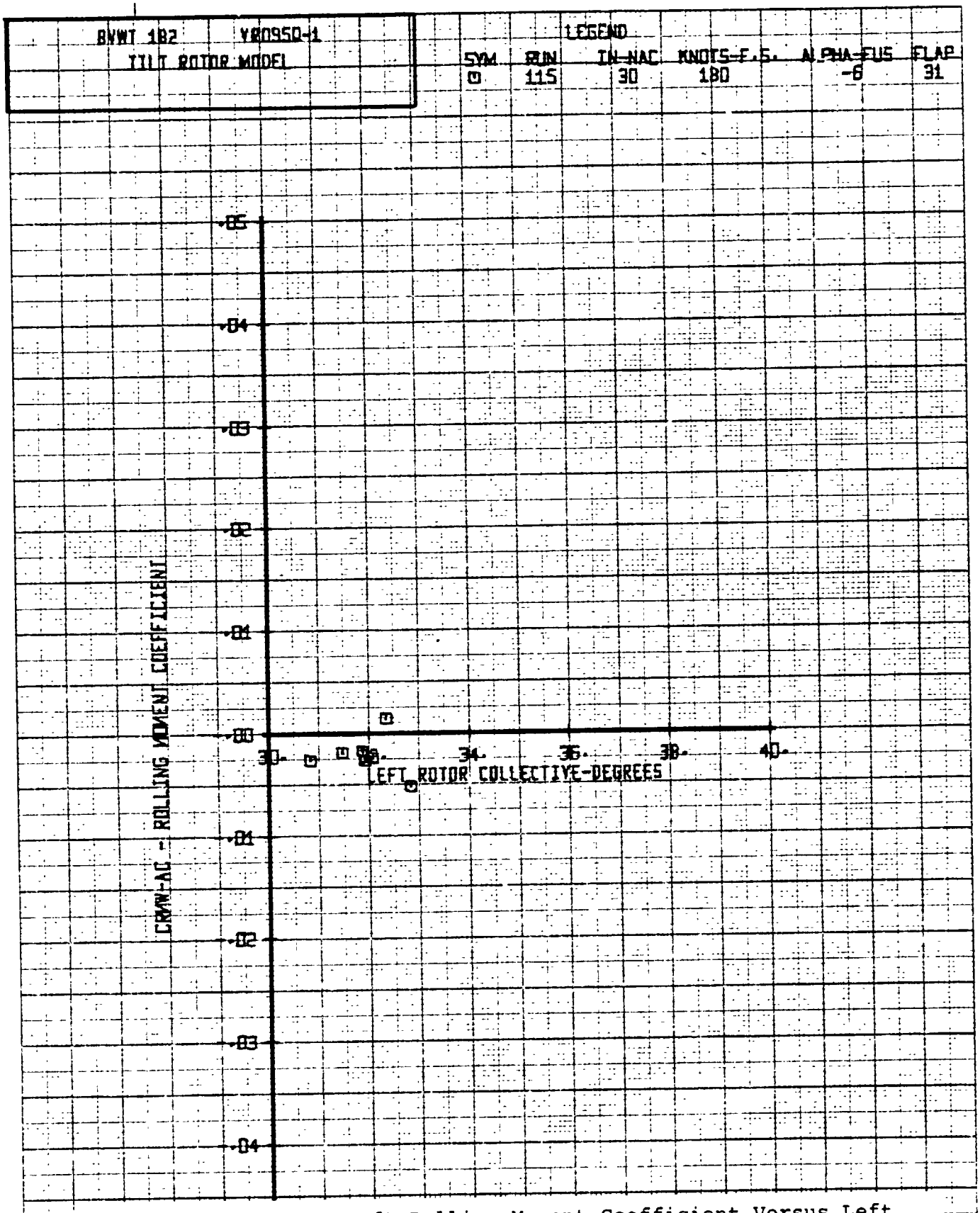


Figure 11-114. Aircraft Rolling Moment Coefficient Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

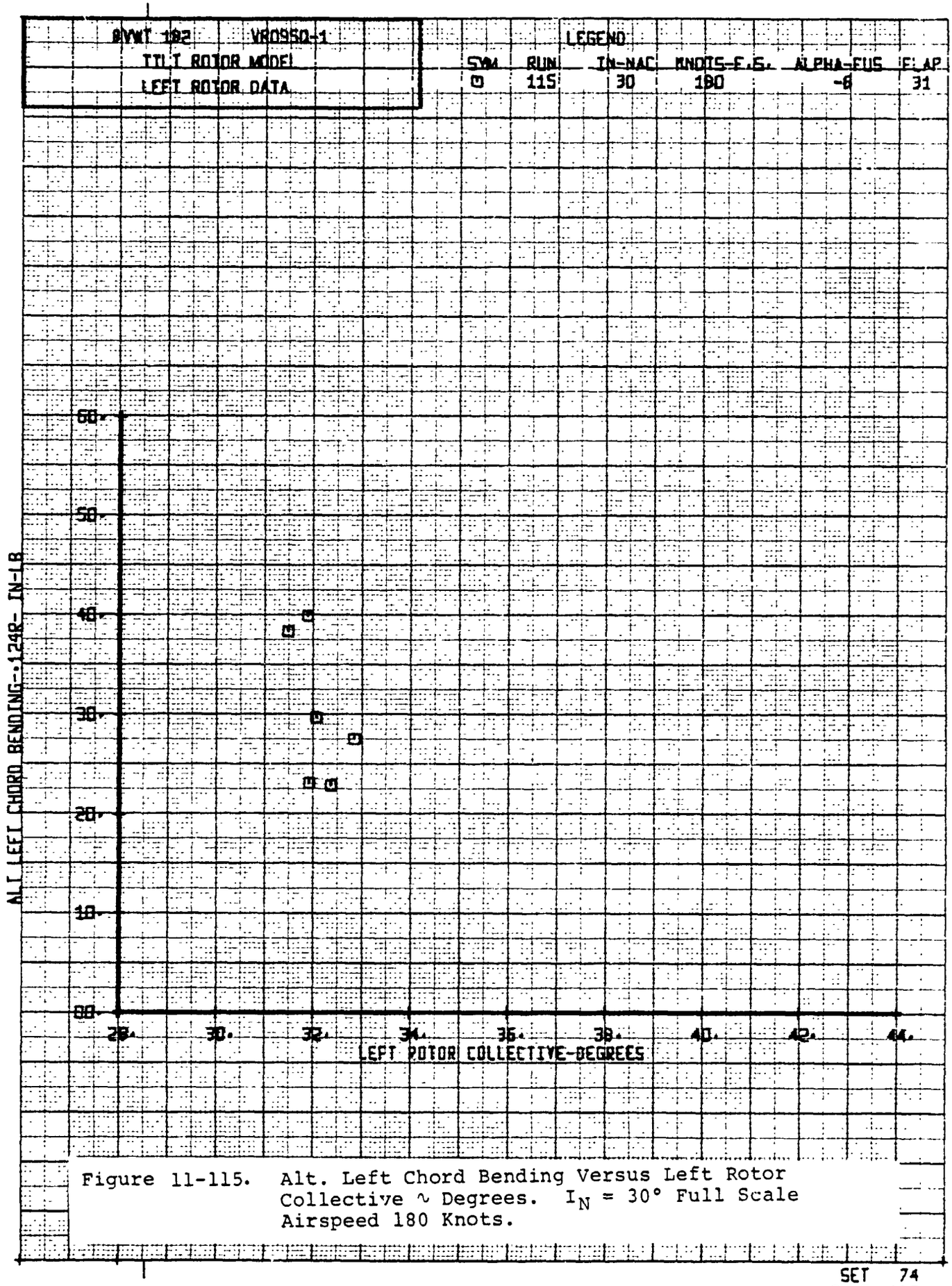
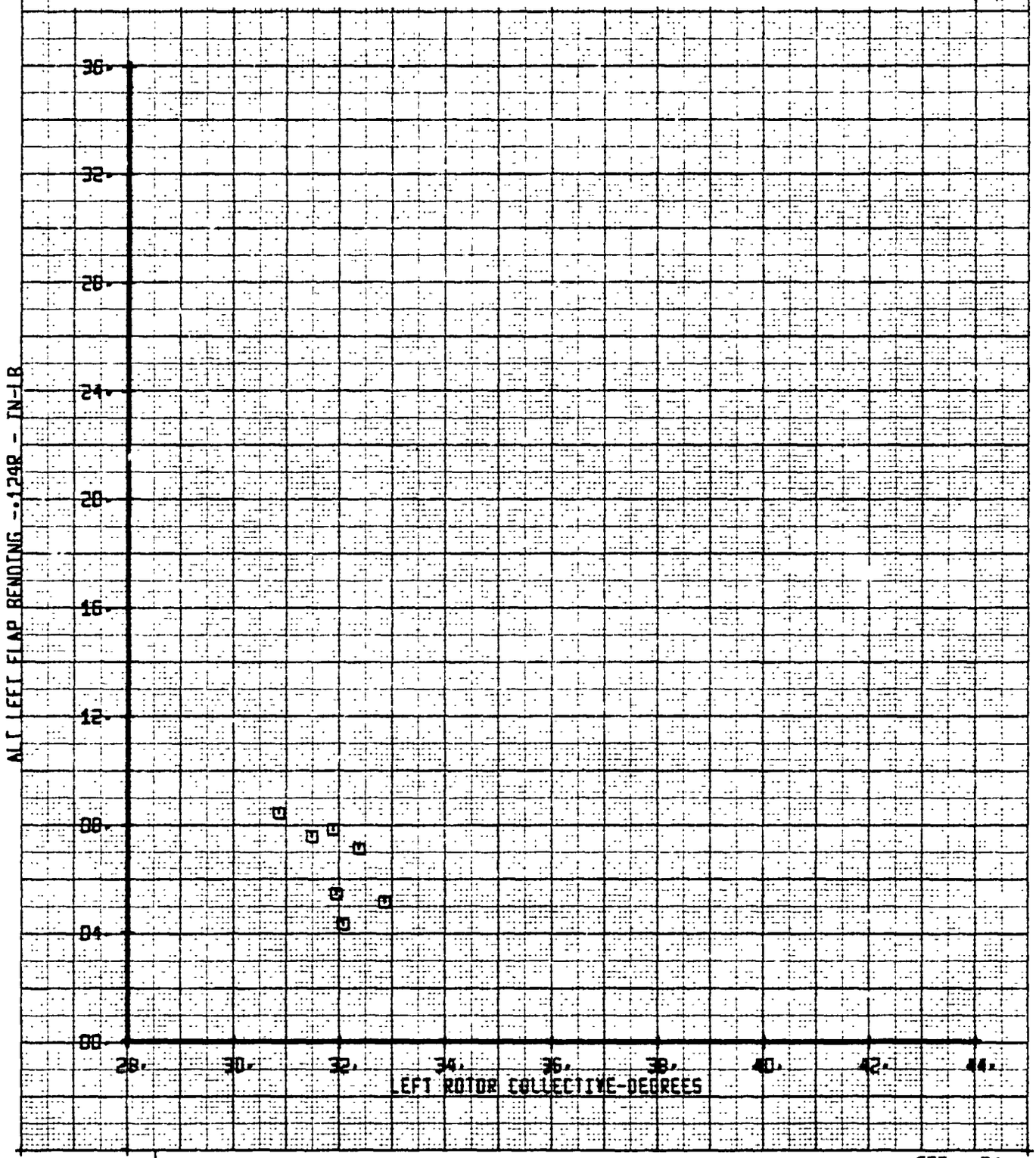


Figure 11-115. Alt. Left Chord Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND	RUN	IN-MAG	KNOTS-F.S.	ALPHA-FUS	FLAP
594	115	30	180	-6	31

Figure 11-116. Alt. Left Flap Bending Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



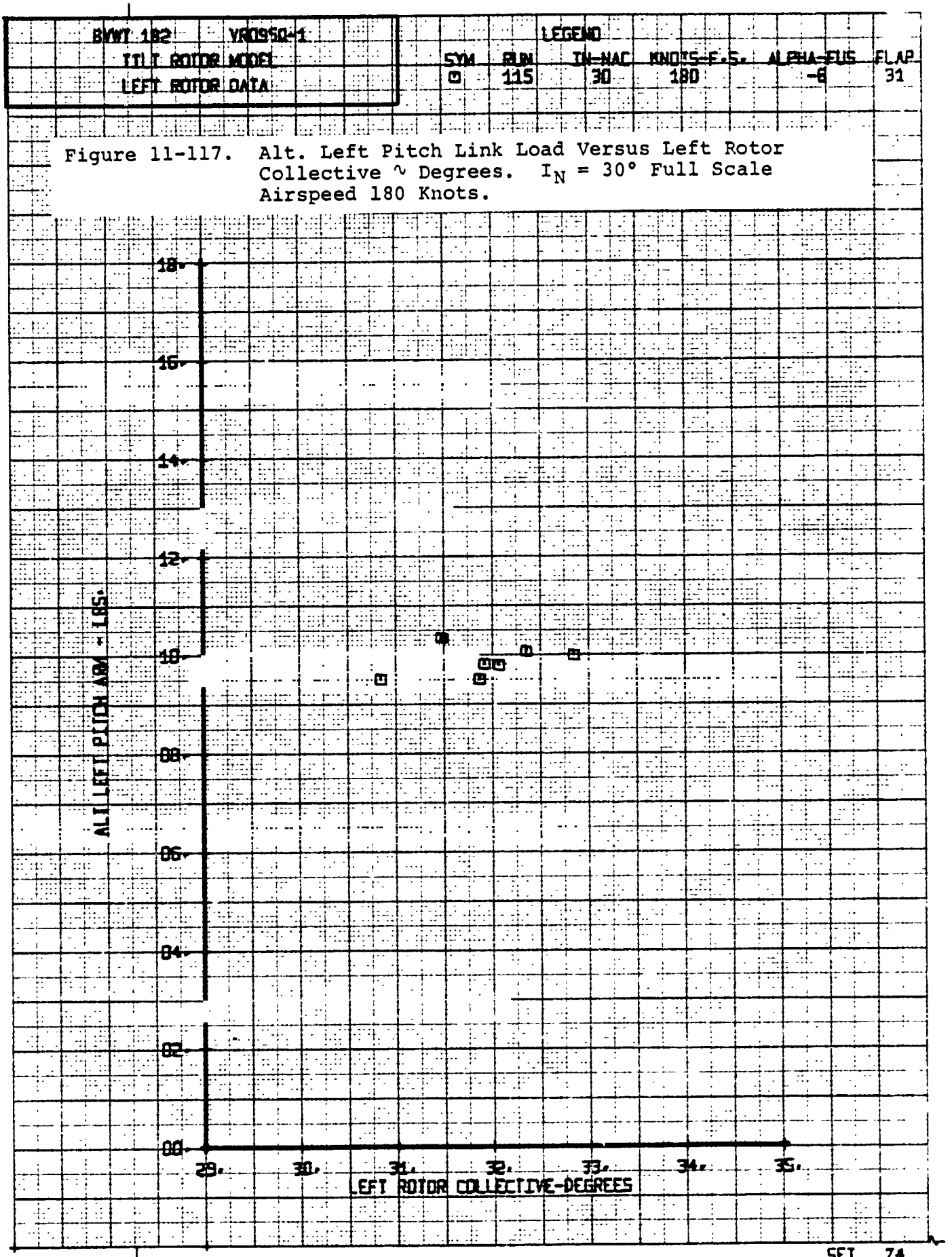


Figure 11-117. Alt. Left Pitch Link Load Versus Left Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

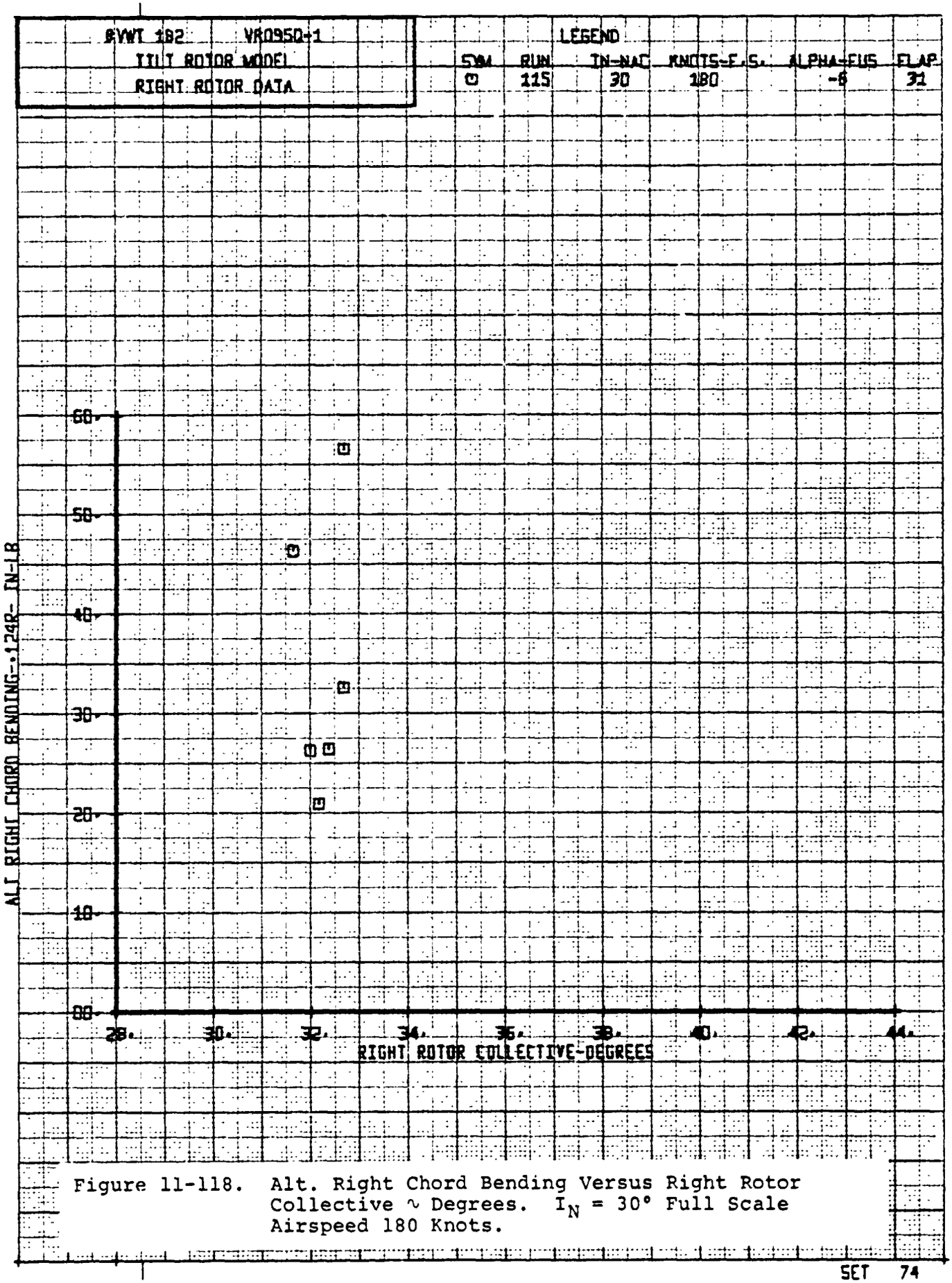


Figure 11-118. Alt. Right Chord Bending Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

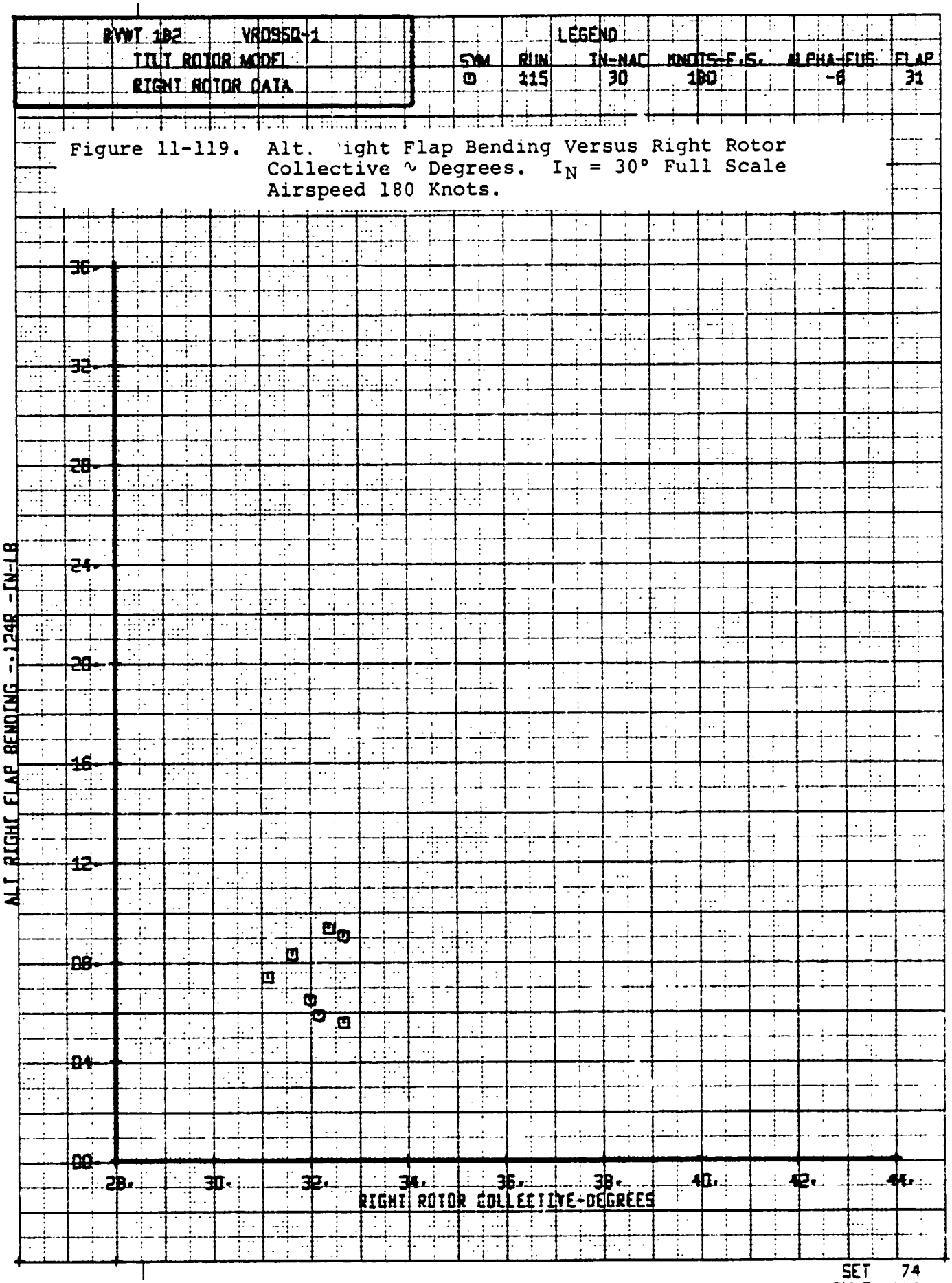


Figure 11-119. Alt. ight Flap Bending Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 74
BVWT 182

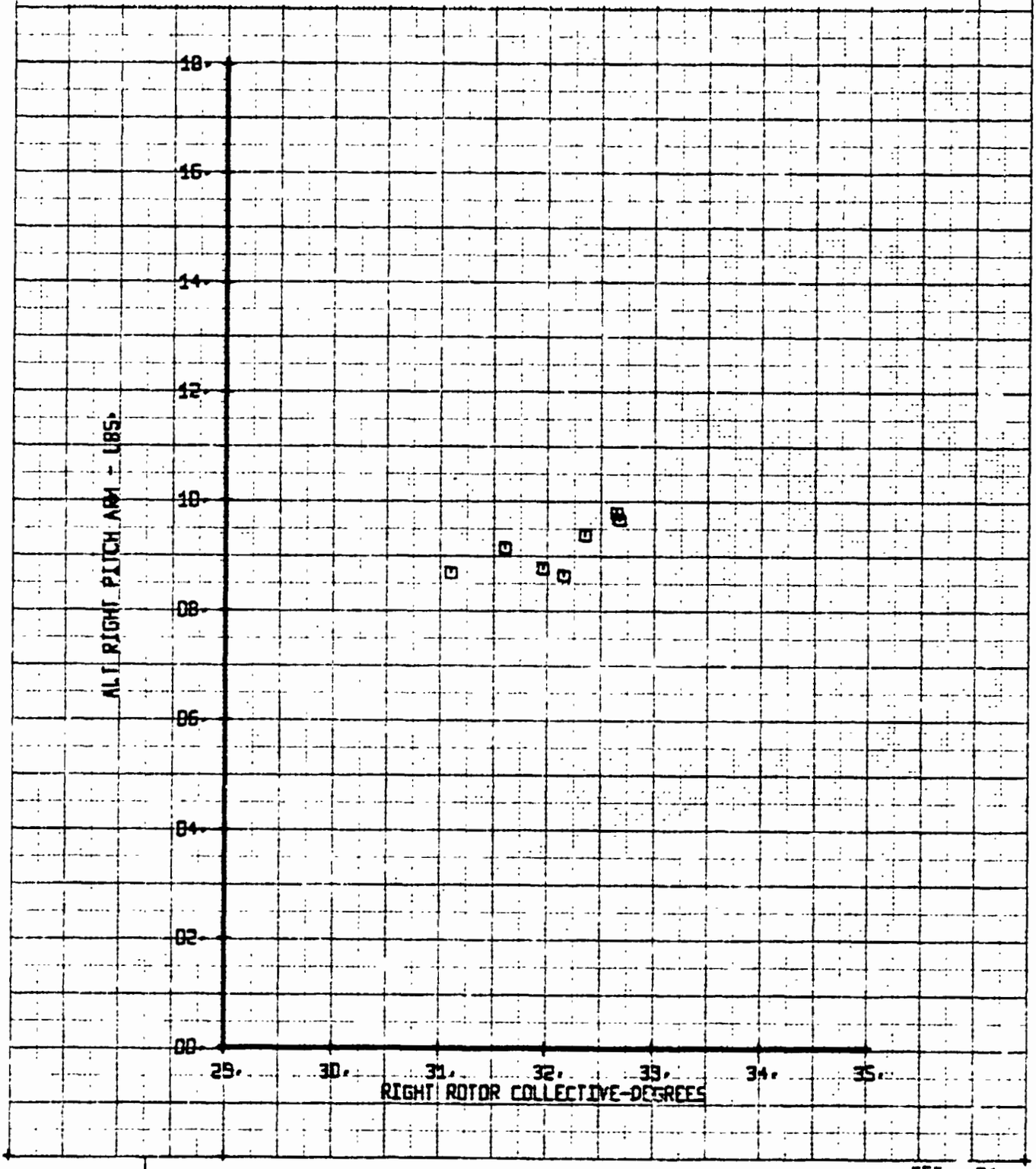
SET 74
BVWT 182

BVWT 182 YR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	115	30	180	-6	31

Figure 11-120. Alt. Right Pitch Link Load Versus Right Rotor Collective ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



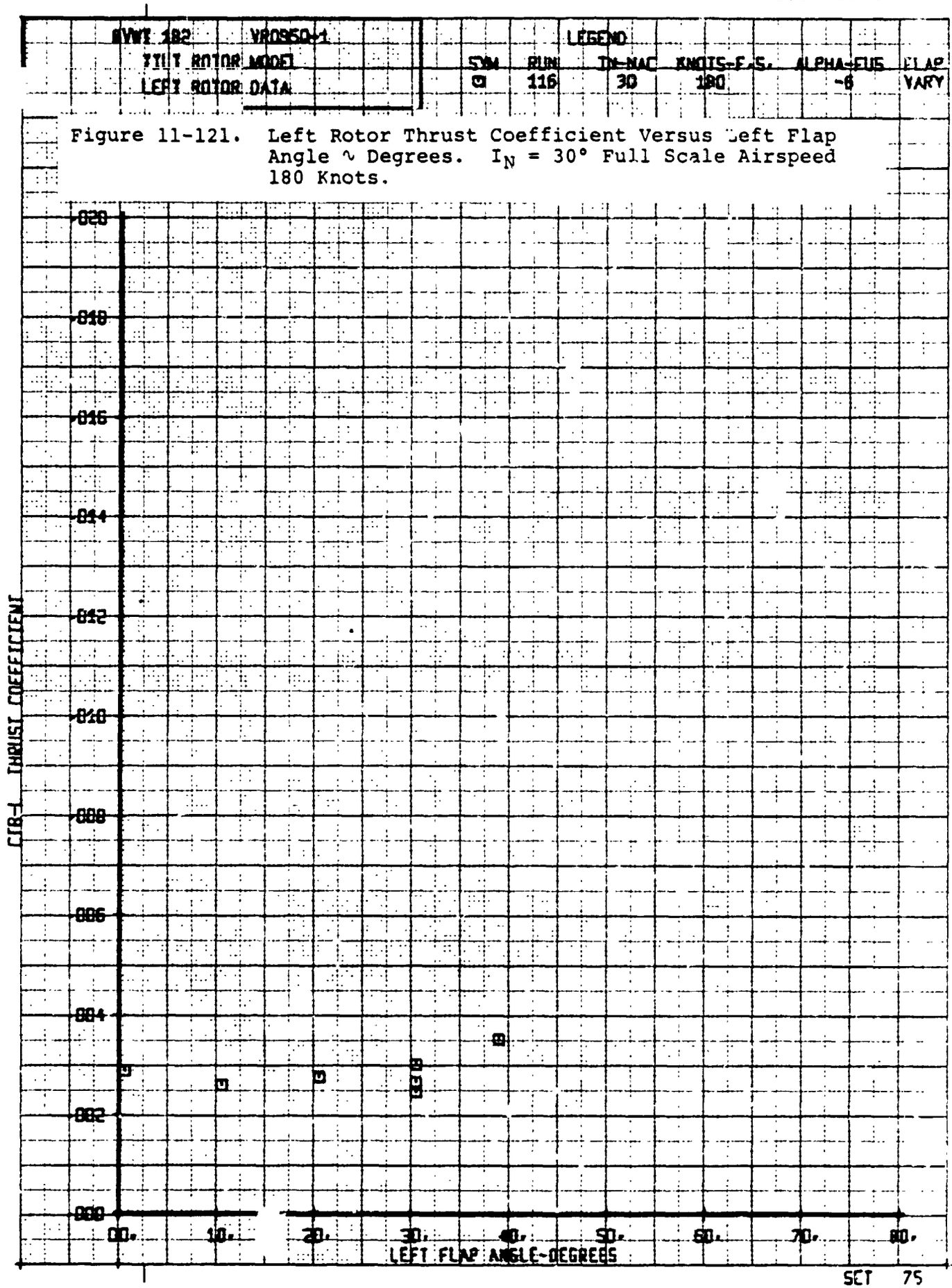


Figure 11-121. Left Rotor Thrust Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

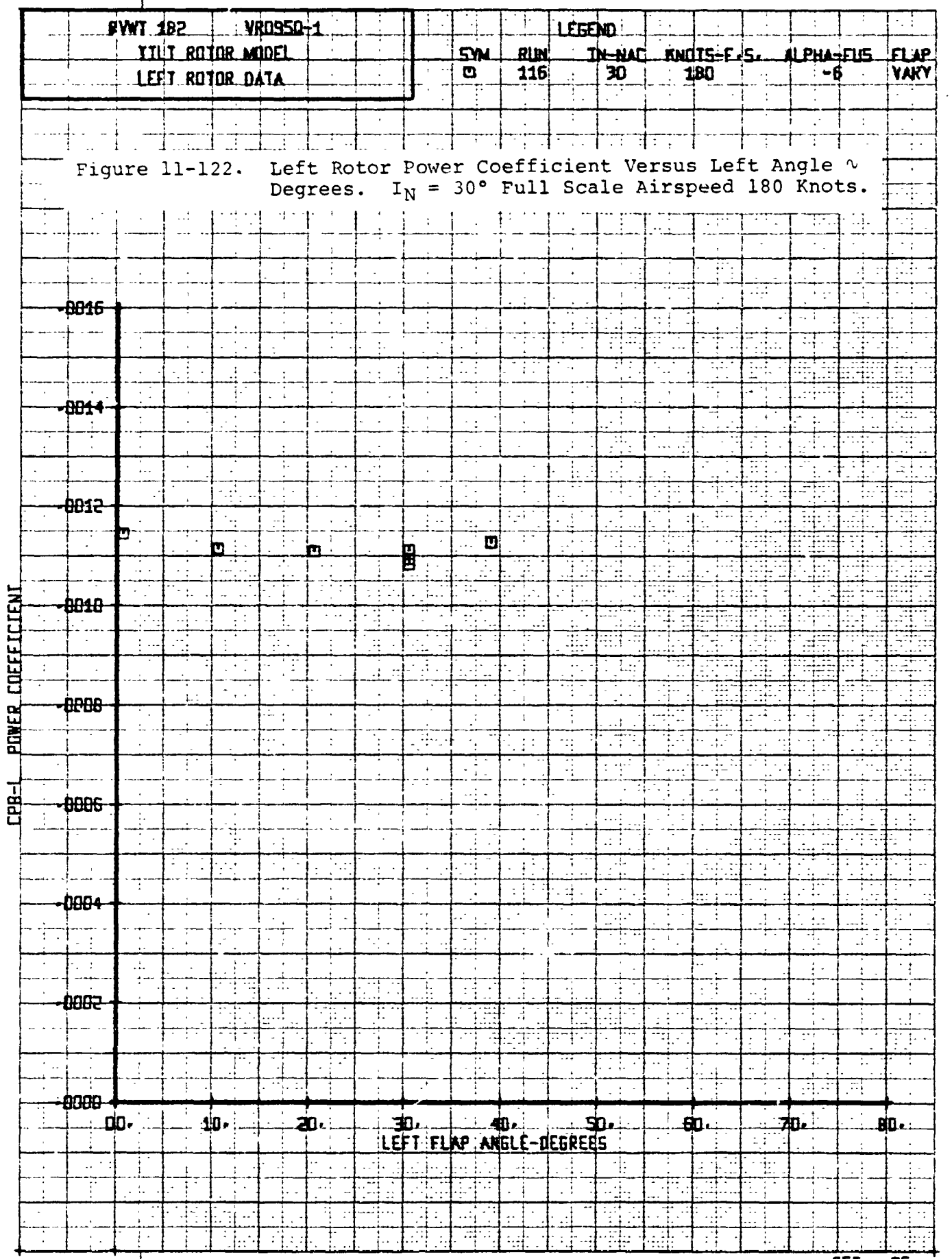
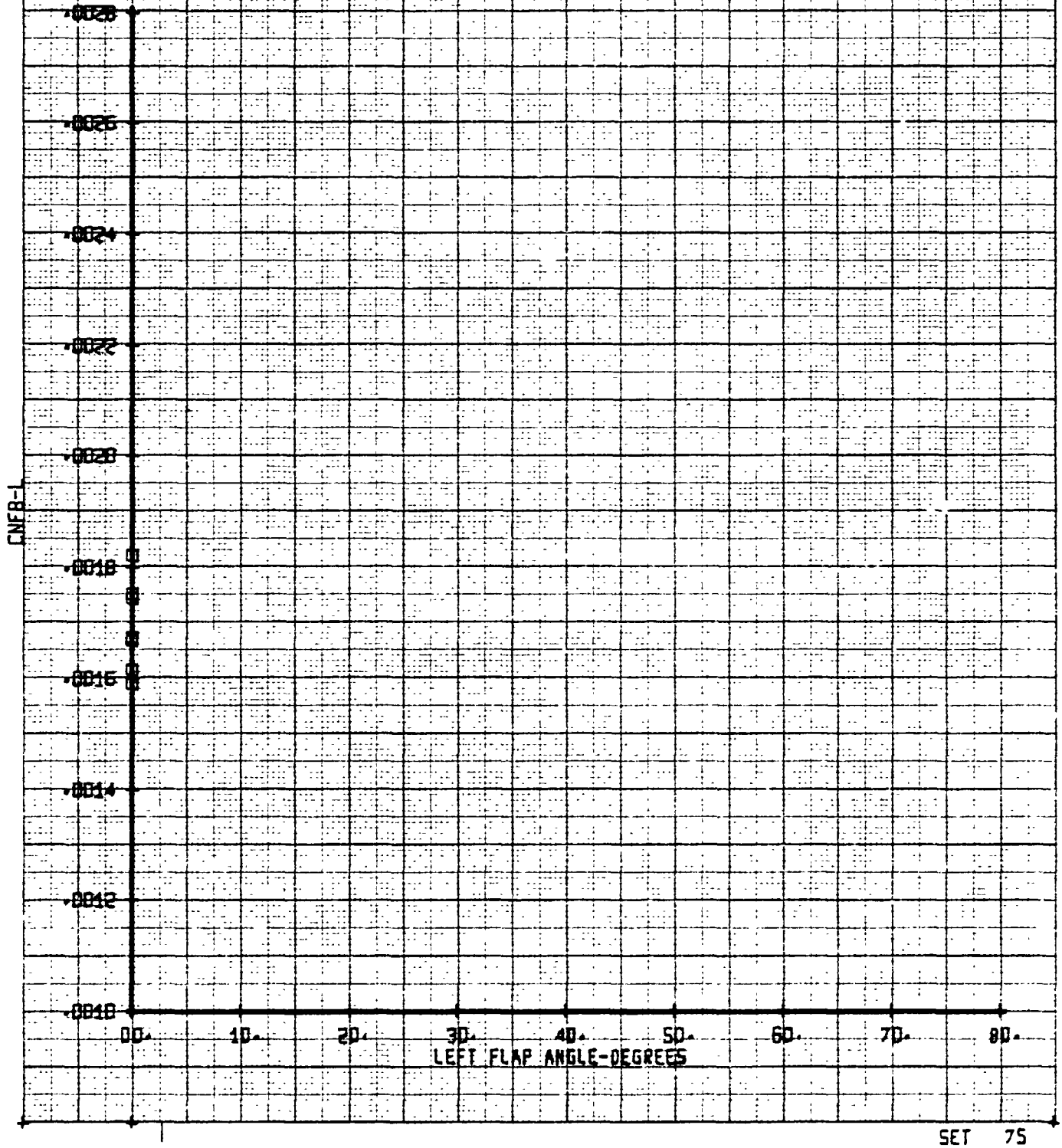


Figure 11-122. Left Rotor Power Coefficient Versus Left Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	116	30	180	-6	VARY

Figure 11-123. Left Rotor Normal Force Coefficient Versus Left Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



E 75
W 182

SET 75
BVWT 182

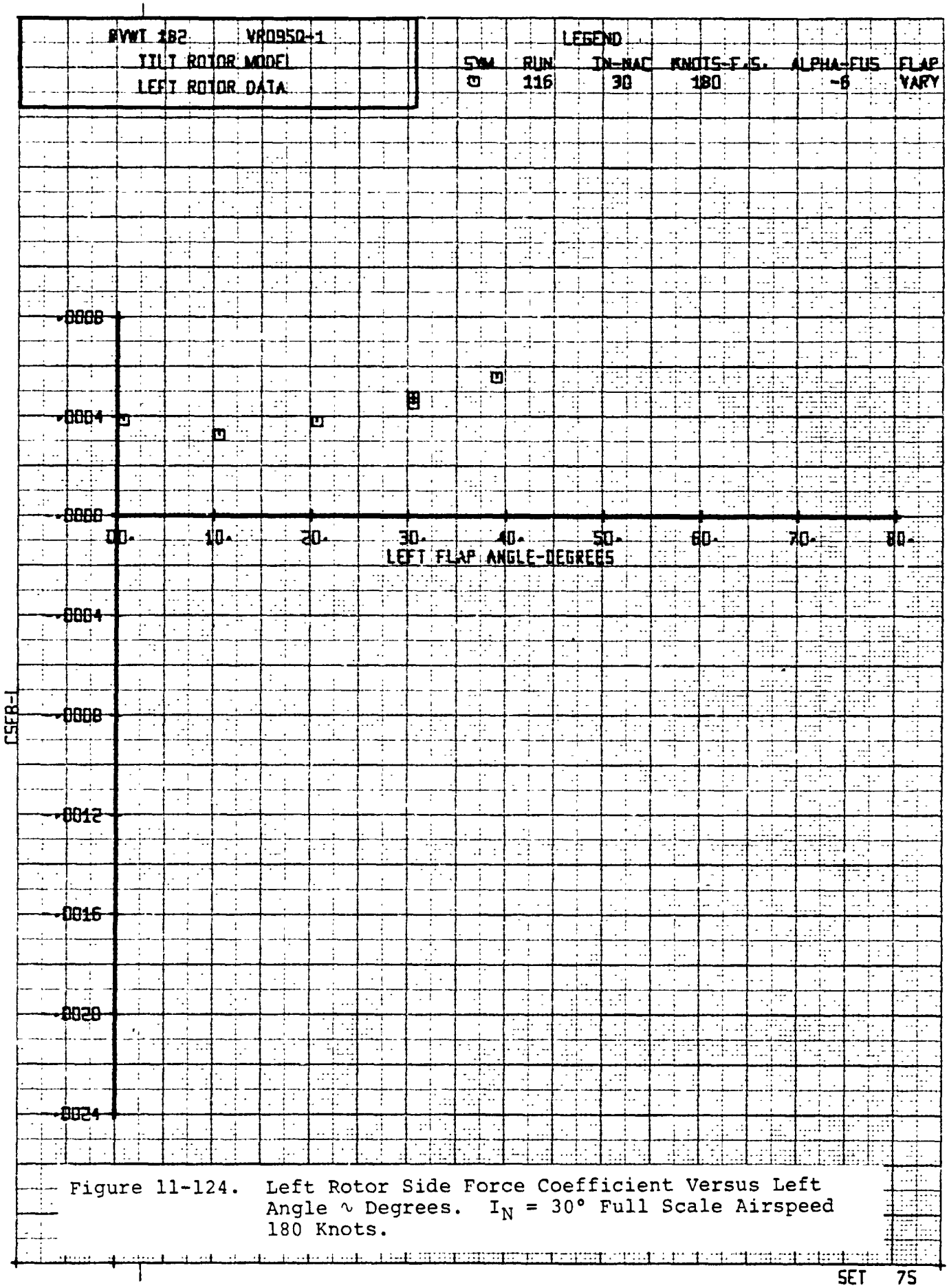


Figure 11-124. Left Rotor Side Force Coefficient Versus Left Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

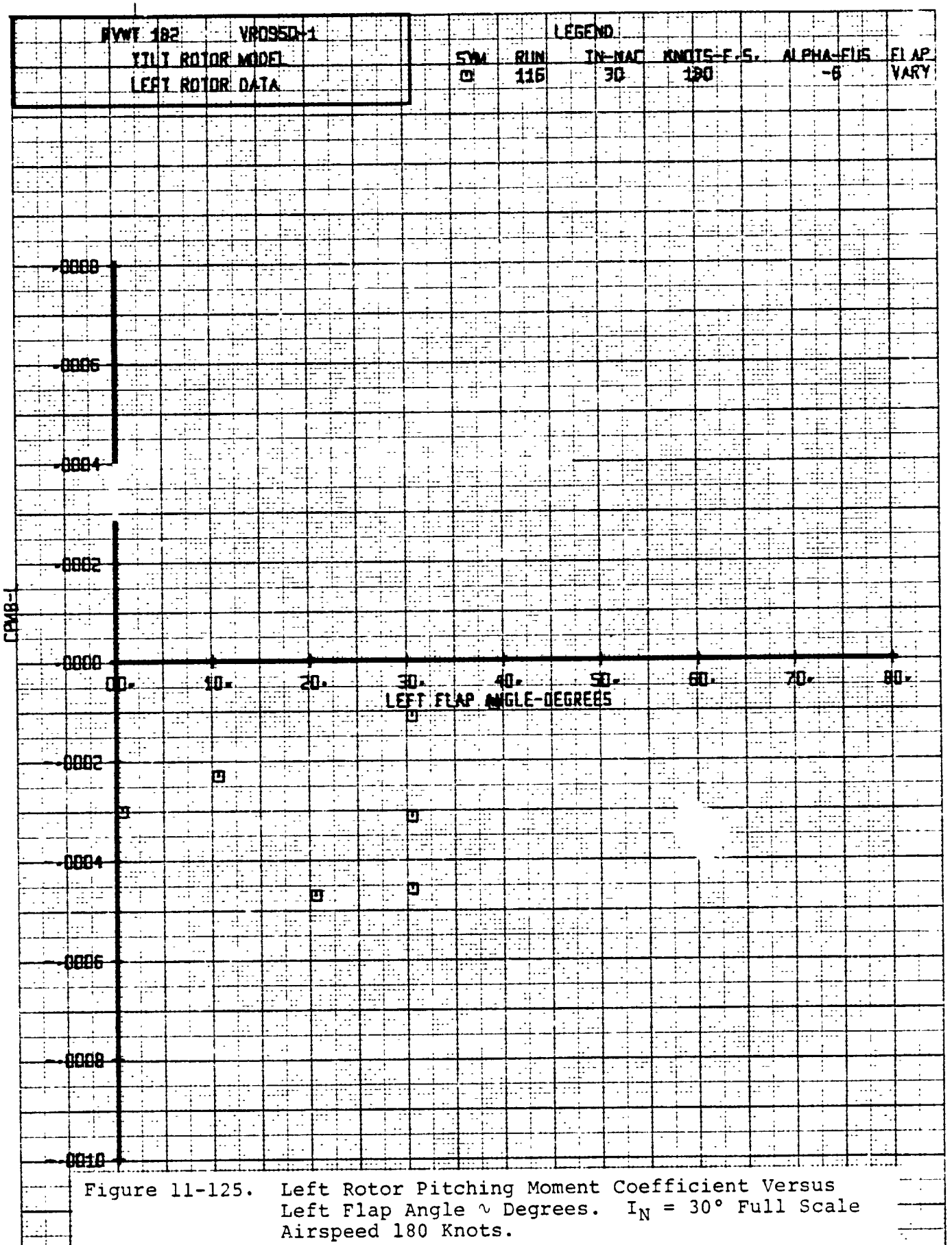


Figure 11-125. Left Rotor Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

SET 75
BVWT 182

SET 75
BVWT 182

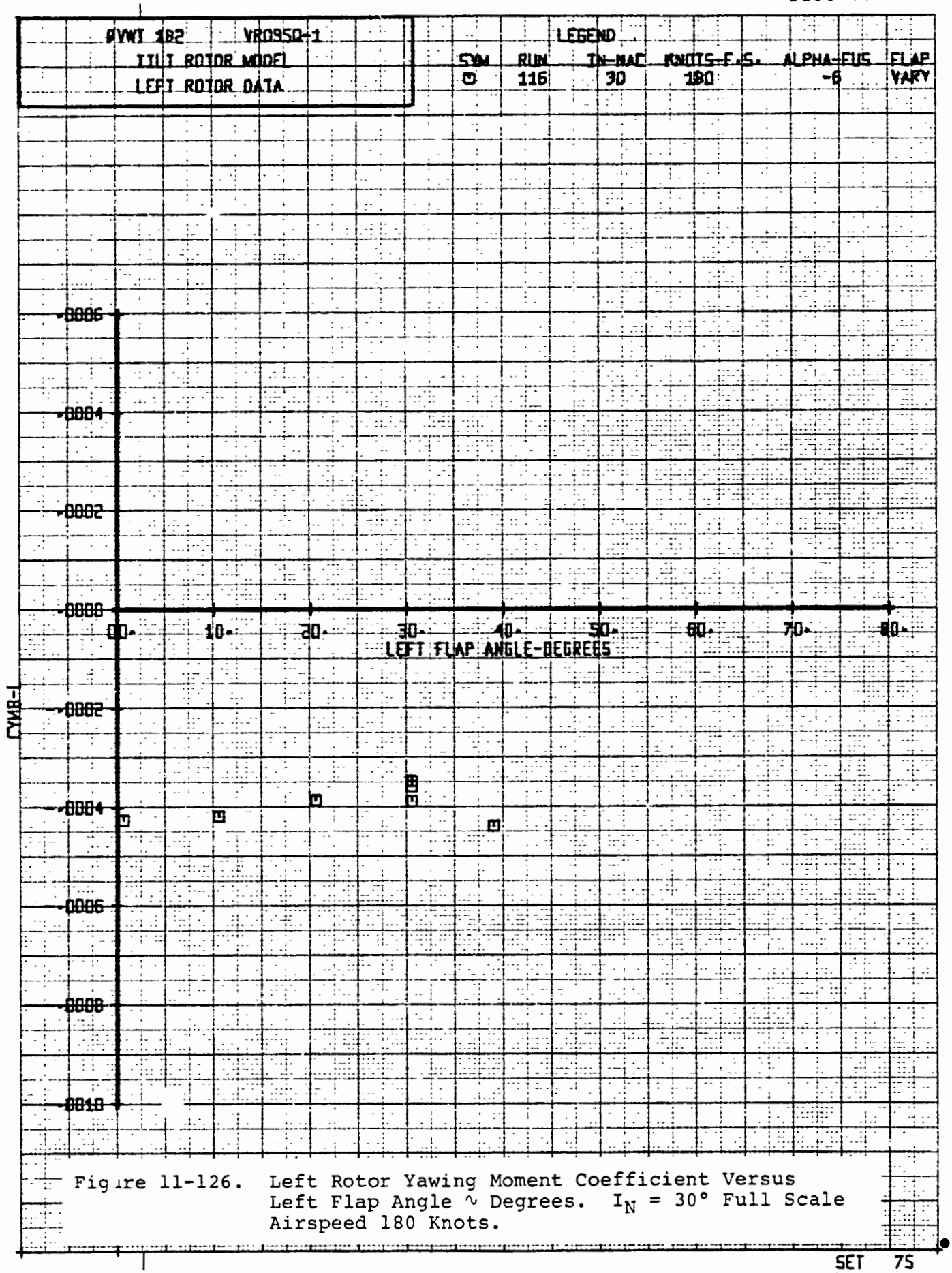


Figure 11-126. Left Rotor Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

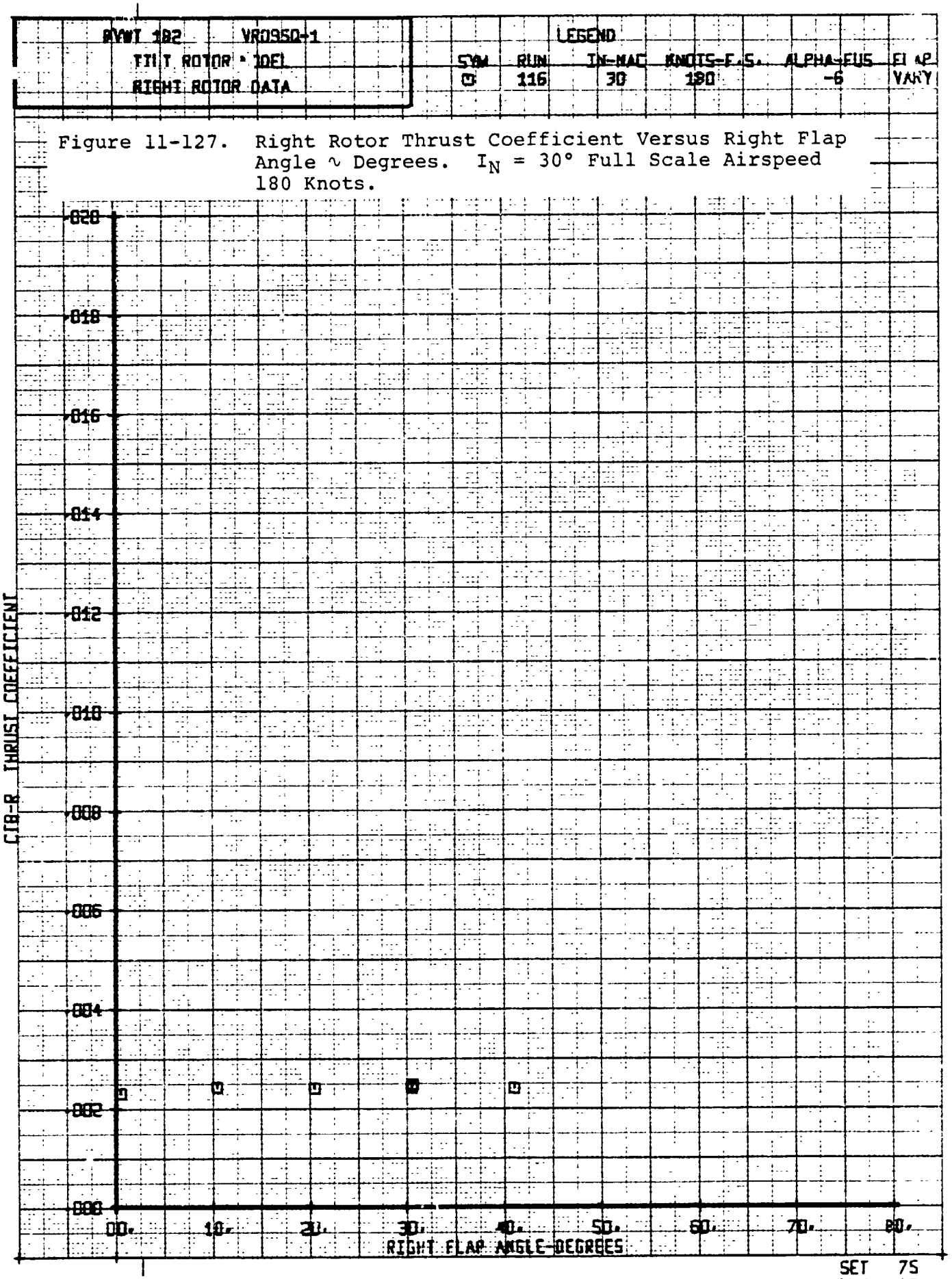


Figure 11-127. Right Rotor Thrust Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

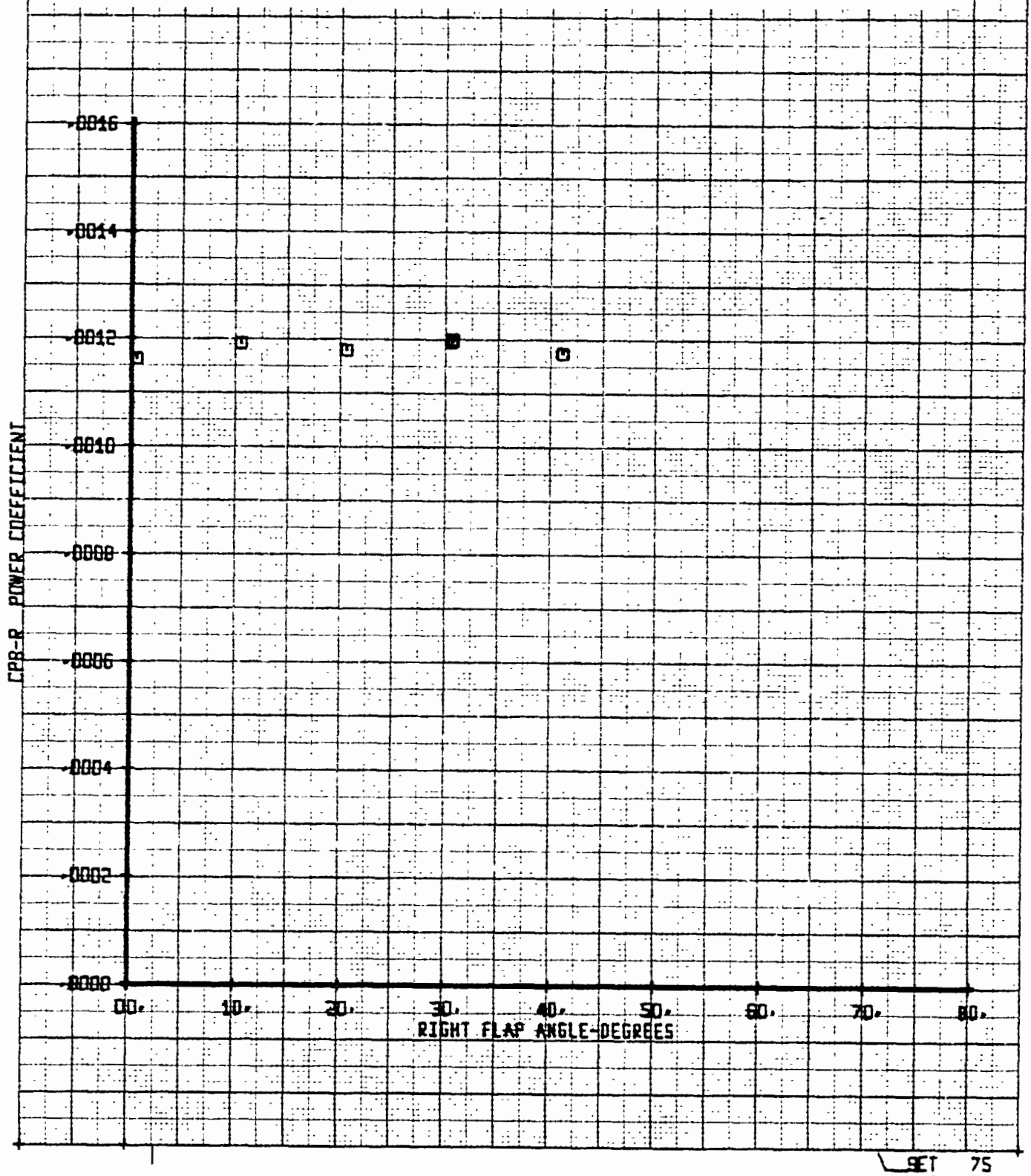
FT 75
182

SET 75
BVWT 182

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	116	30	180	-6	VARY

Figure 11-128. Right Rotor Power Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



75
182

SET 75
BVWT 182

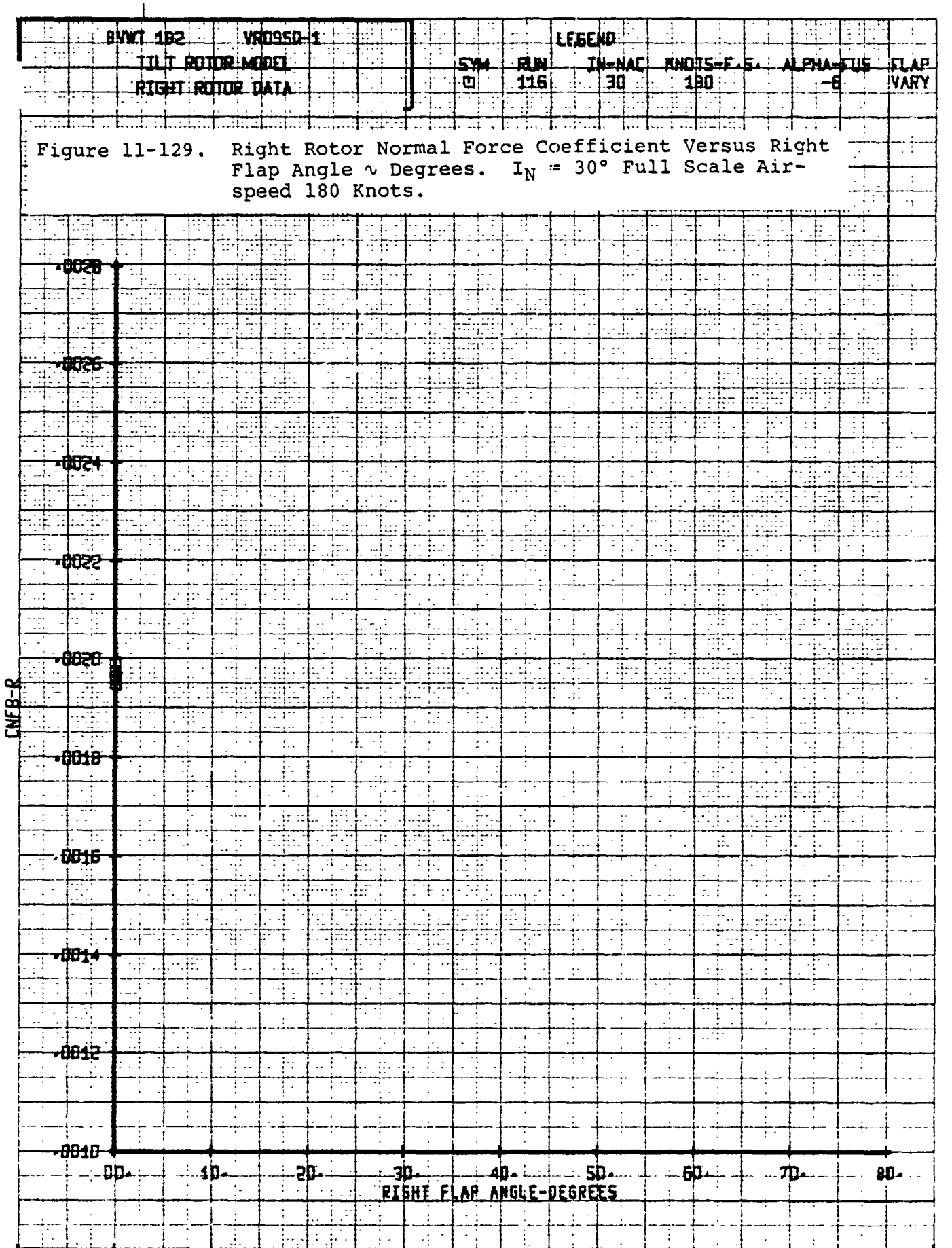


Figure 11-129. Right Rotor Normal Force Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

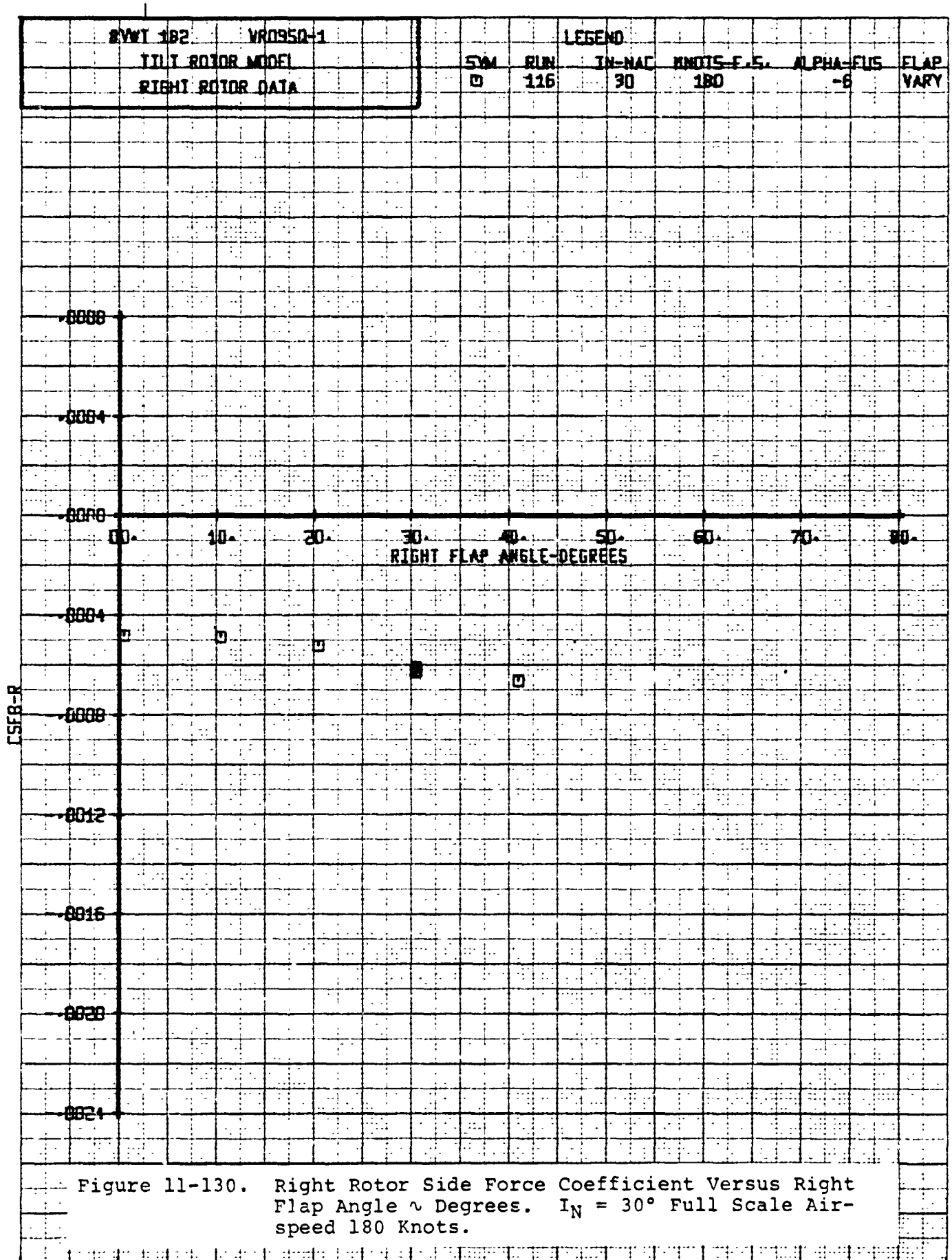


Figure 11-130. Right Rotor Side Force Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

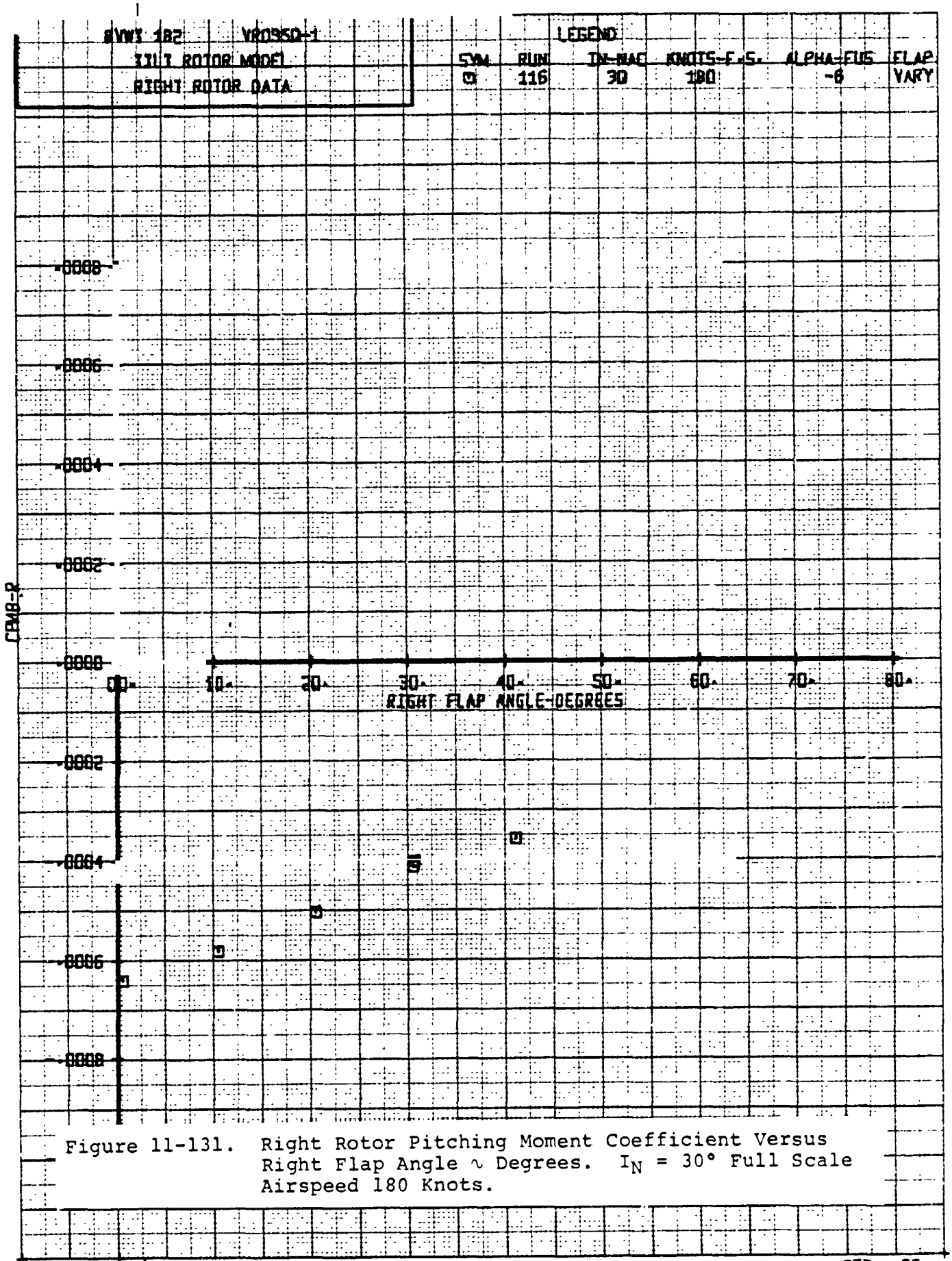


Figure 11-131. Right Rotor Pitching Moment Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

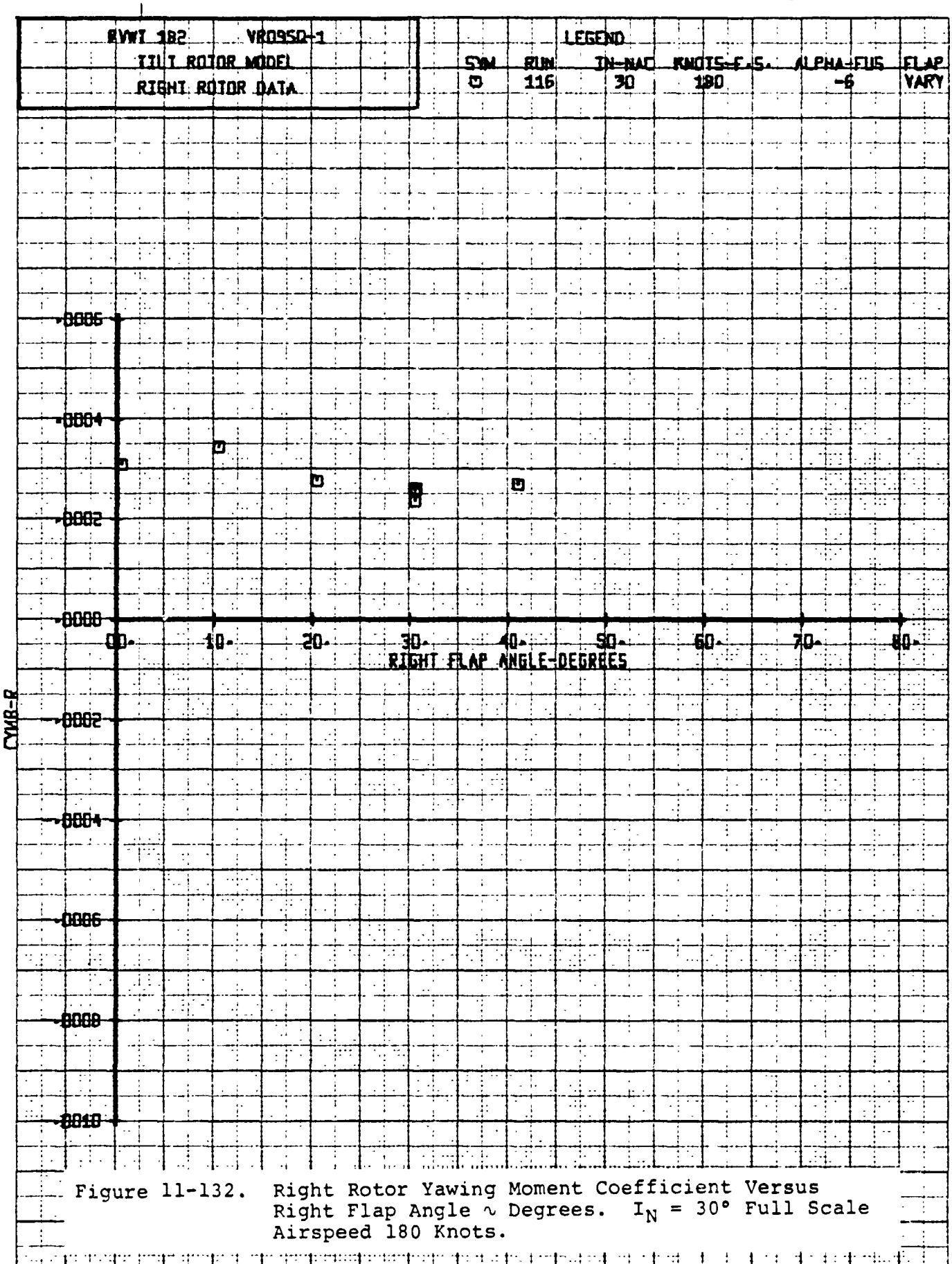


Figure 11-132. Right Rotor Yawing Moment Coefficient Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

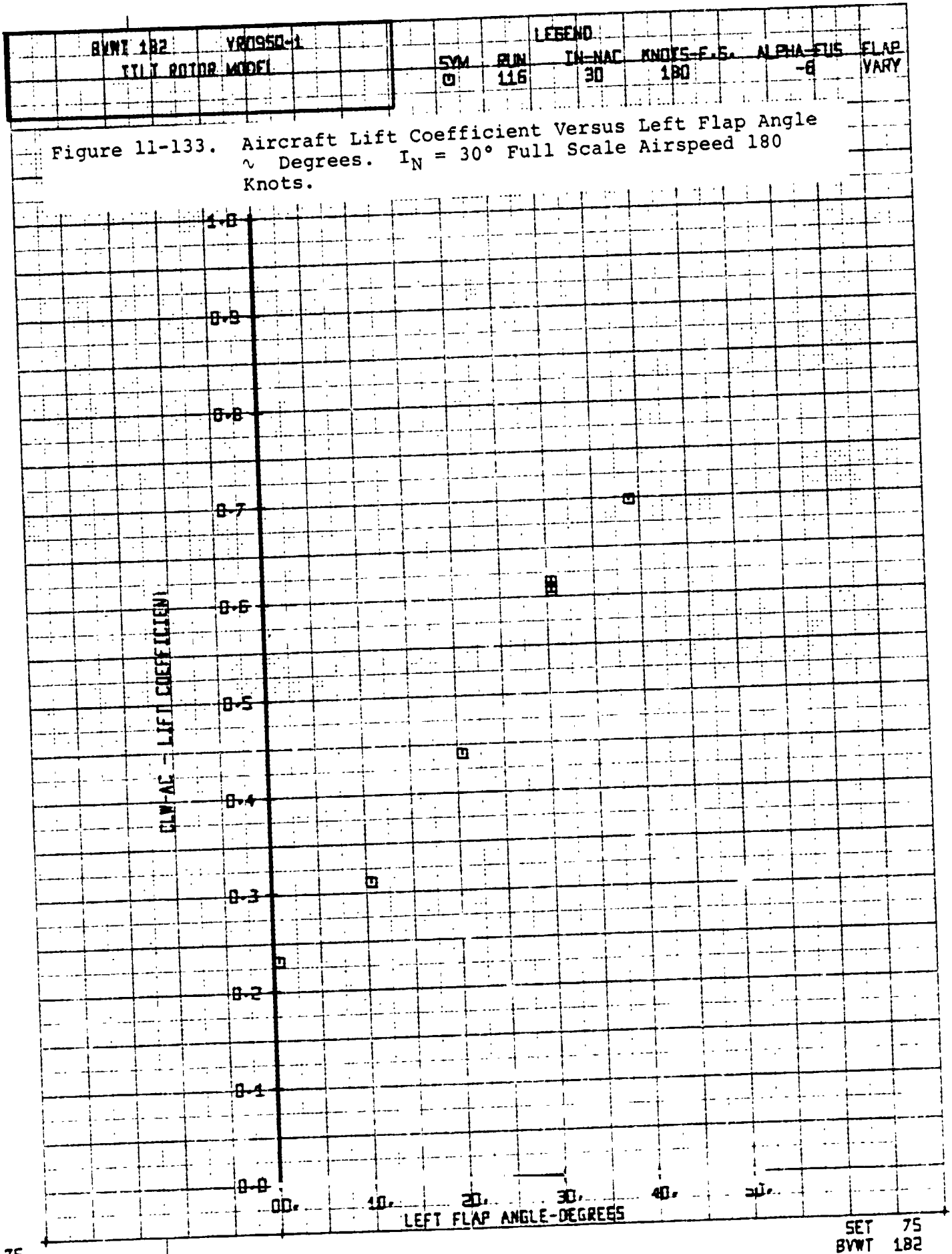


Figure 11-133. Aircraft Lift Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 75
V 182

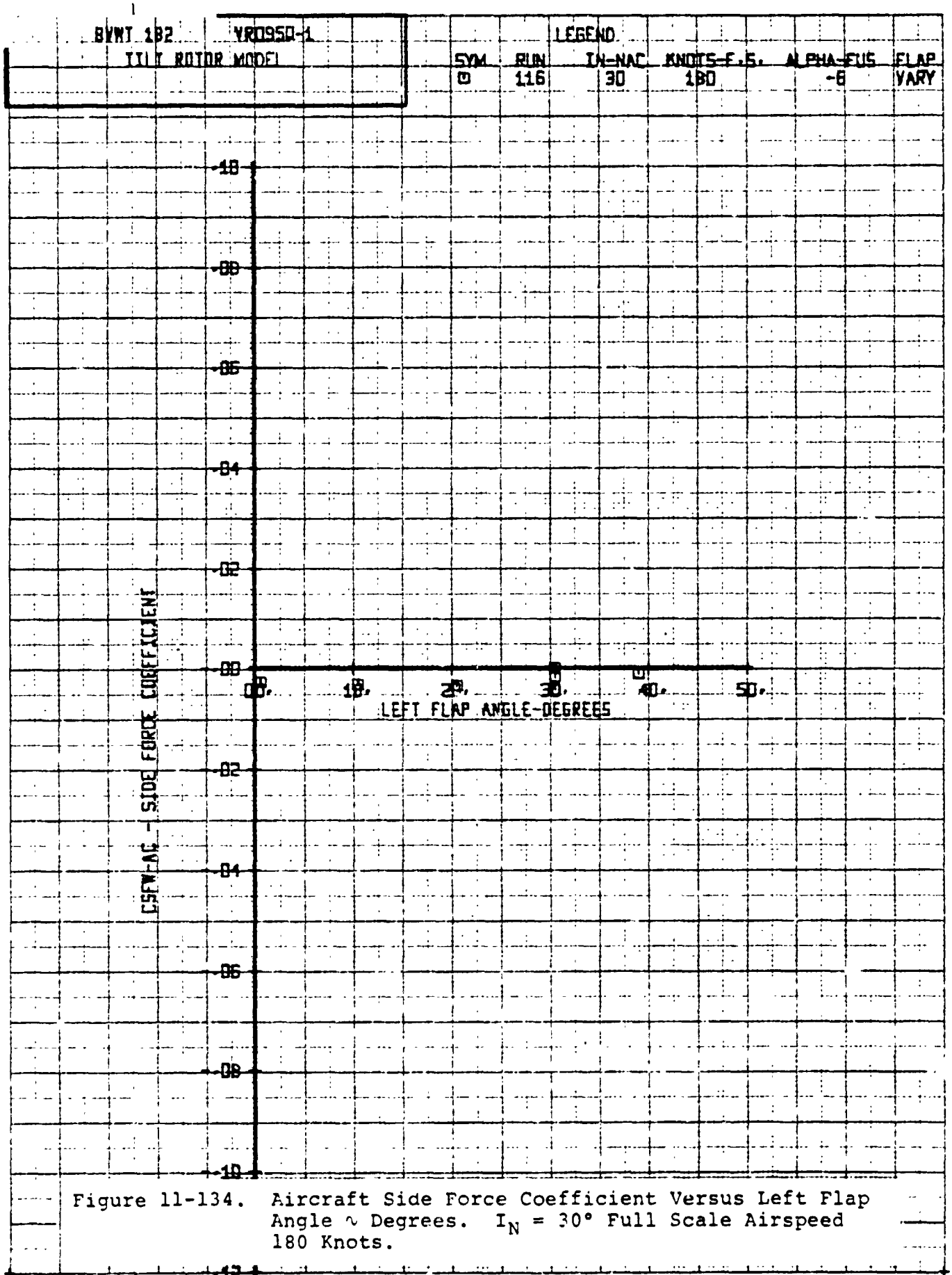


Figure 11-134. Aircraft Side Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

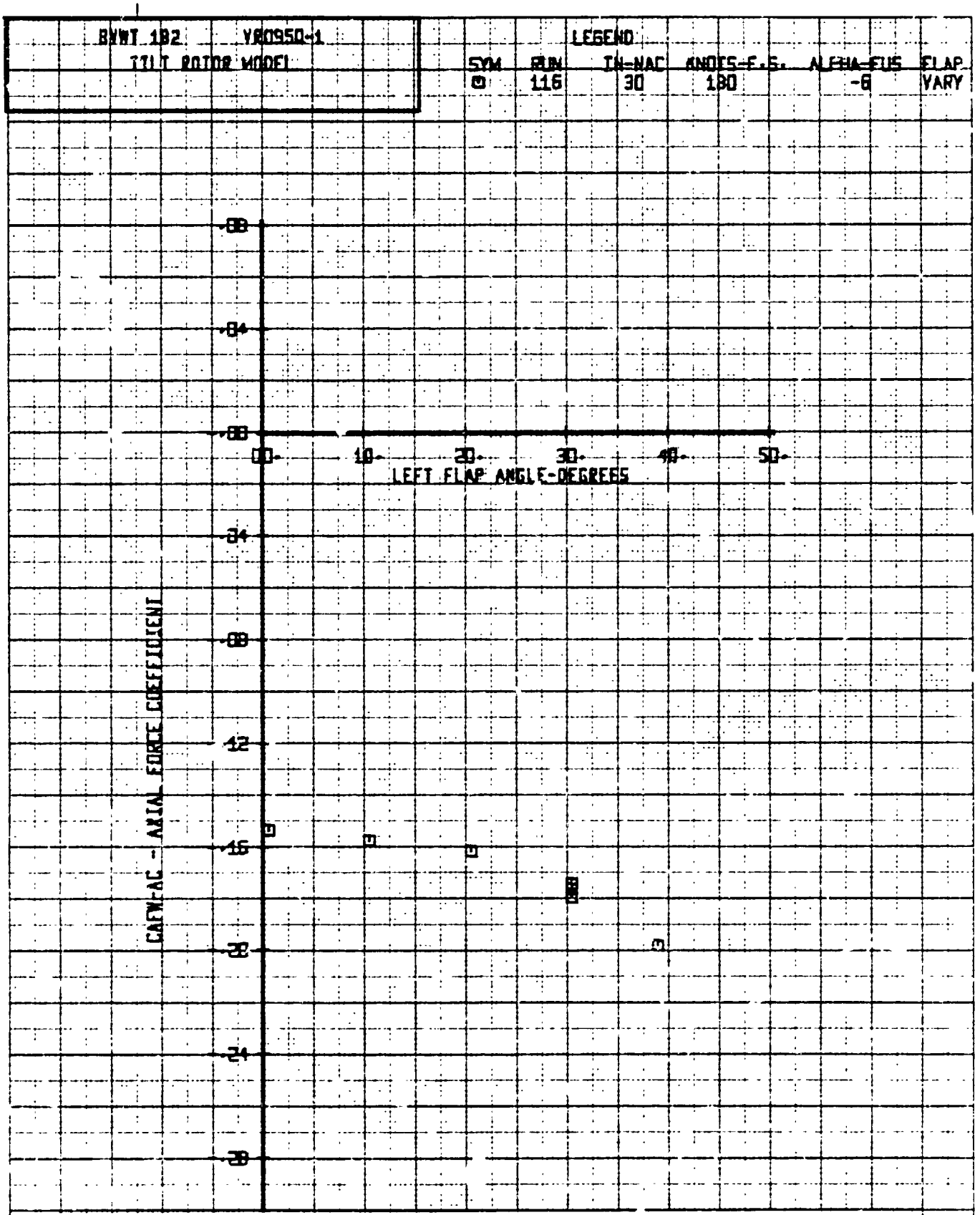


Figure 11-135. Aircraft Axial Force Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 75
1 182

SET 75
BWWT 182

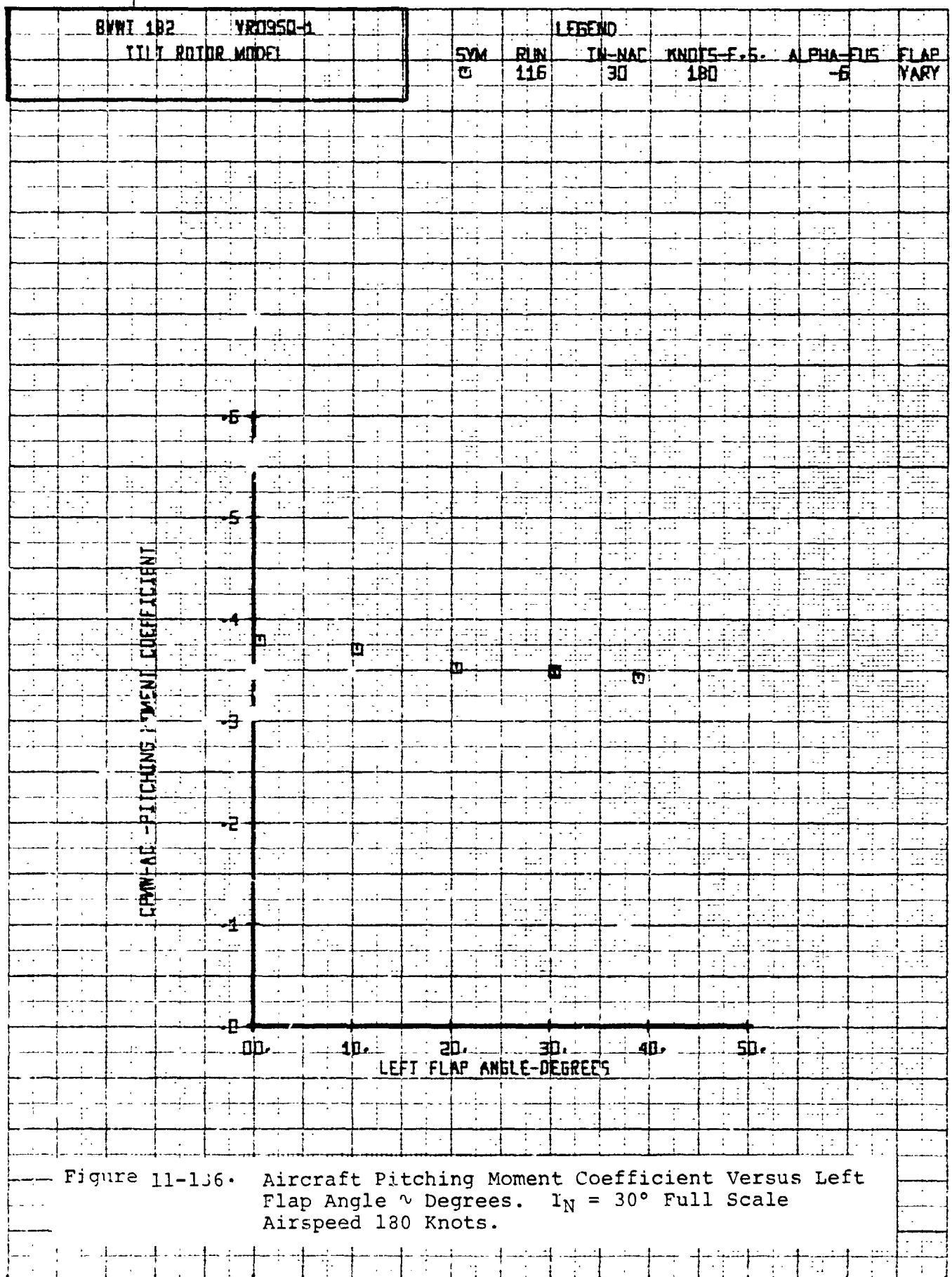


Figure 11-136. Aircraft Pitching Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

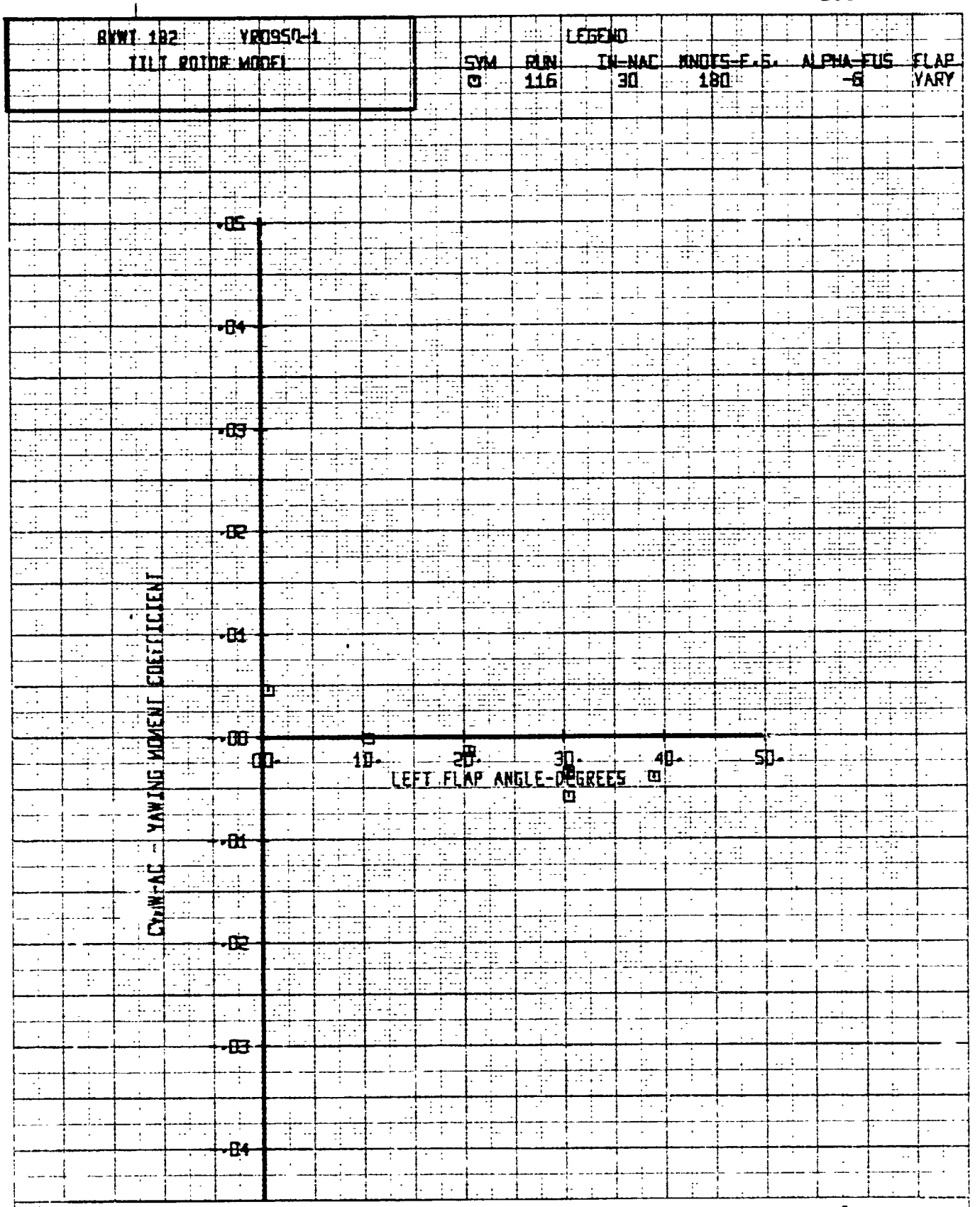


Figure 1`-137. Aircraft Yawing Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

FT 75
W 182

SET 75
BVWT 182

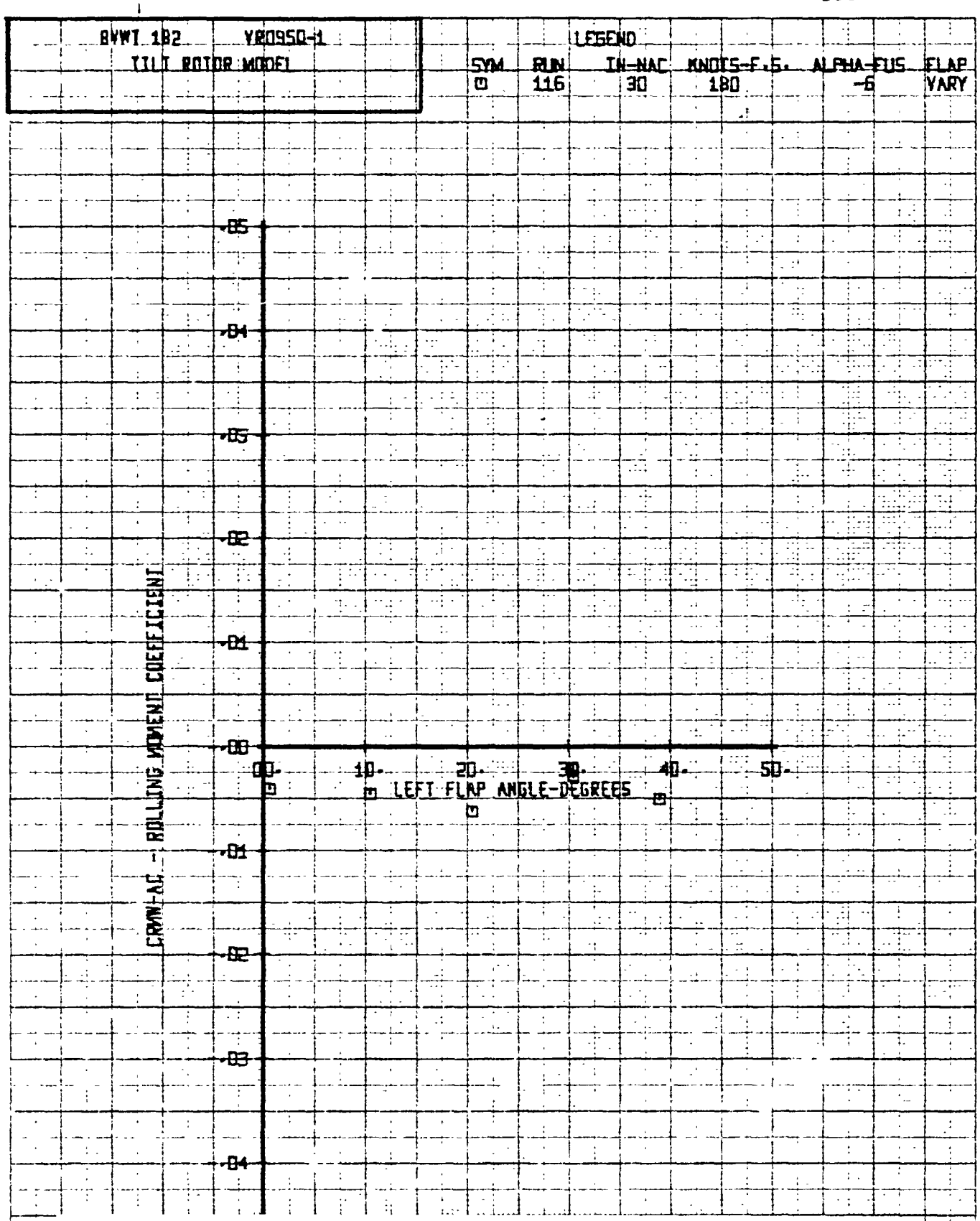


Figure 11-138. Aircraft Rolling Moment Coefficient Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

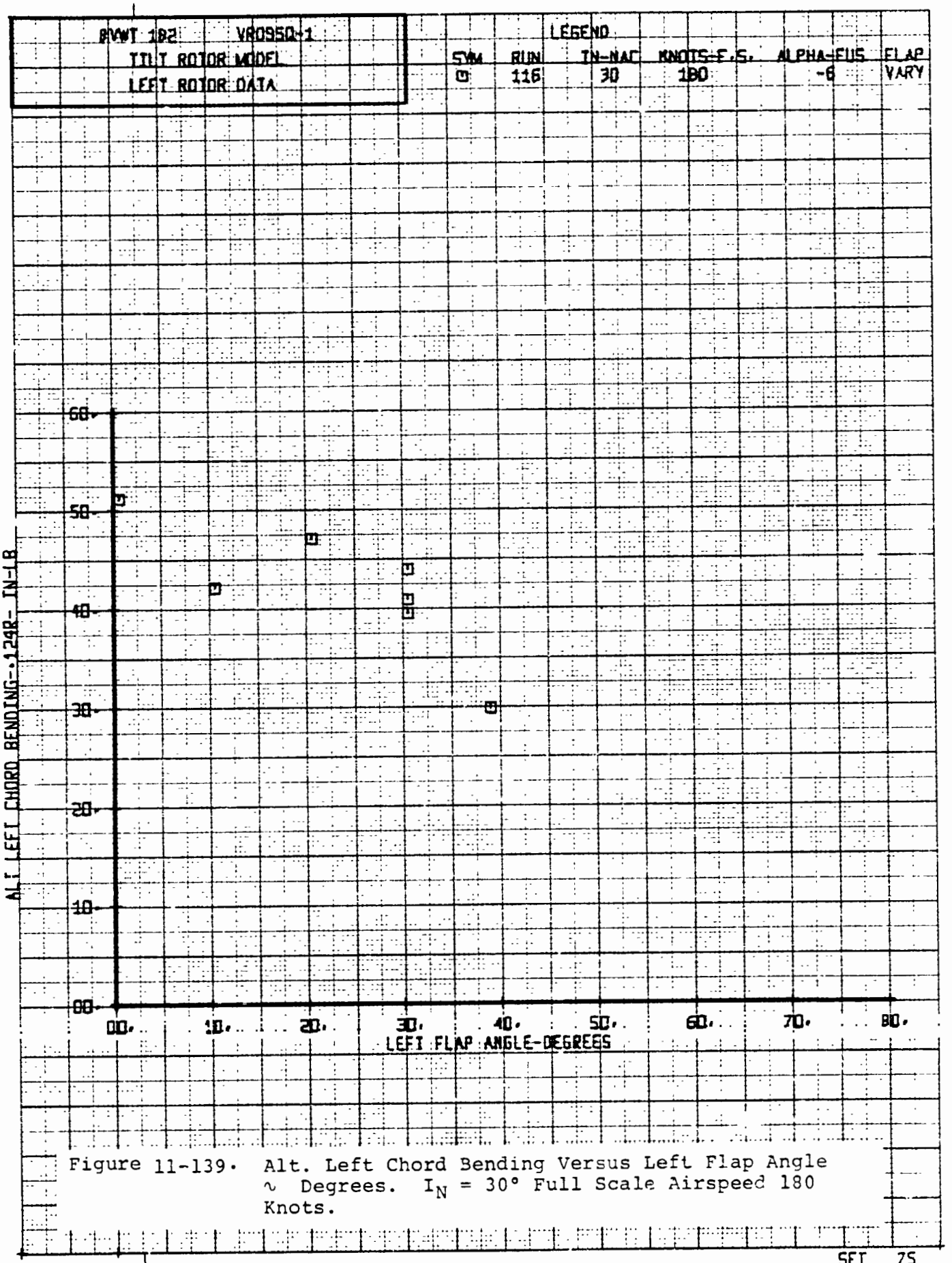
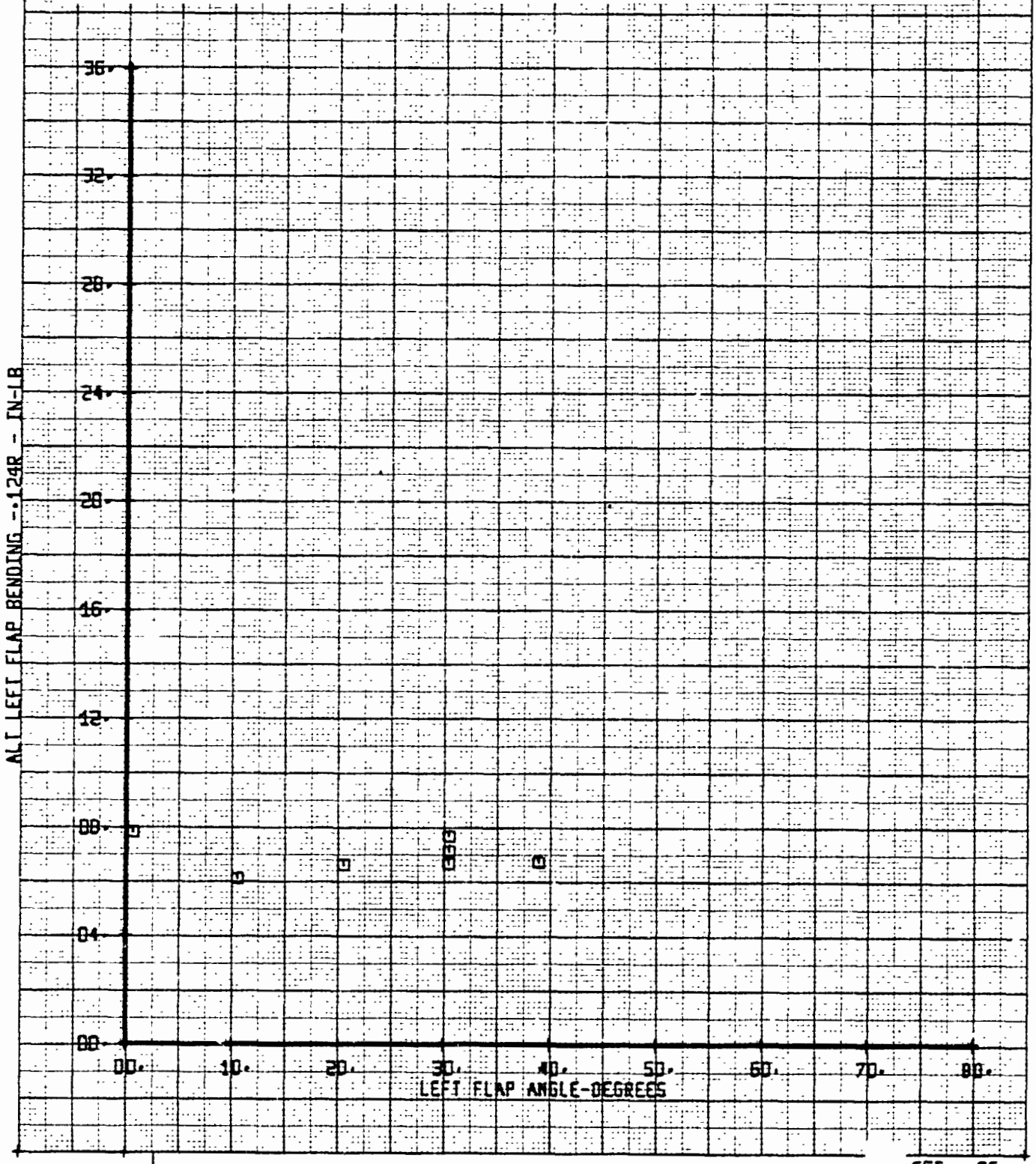


Figure 11-139. Alt. Left Chord Bending Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	116	30	180	-8	VARY

Figure 11-140. Alt. Left Flap Bending Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



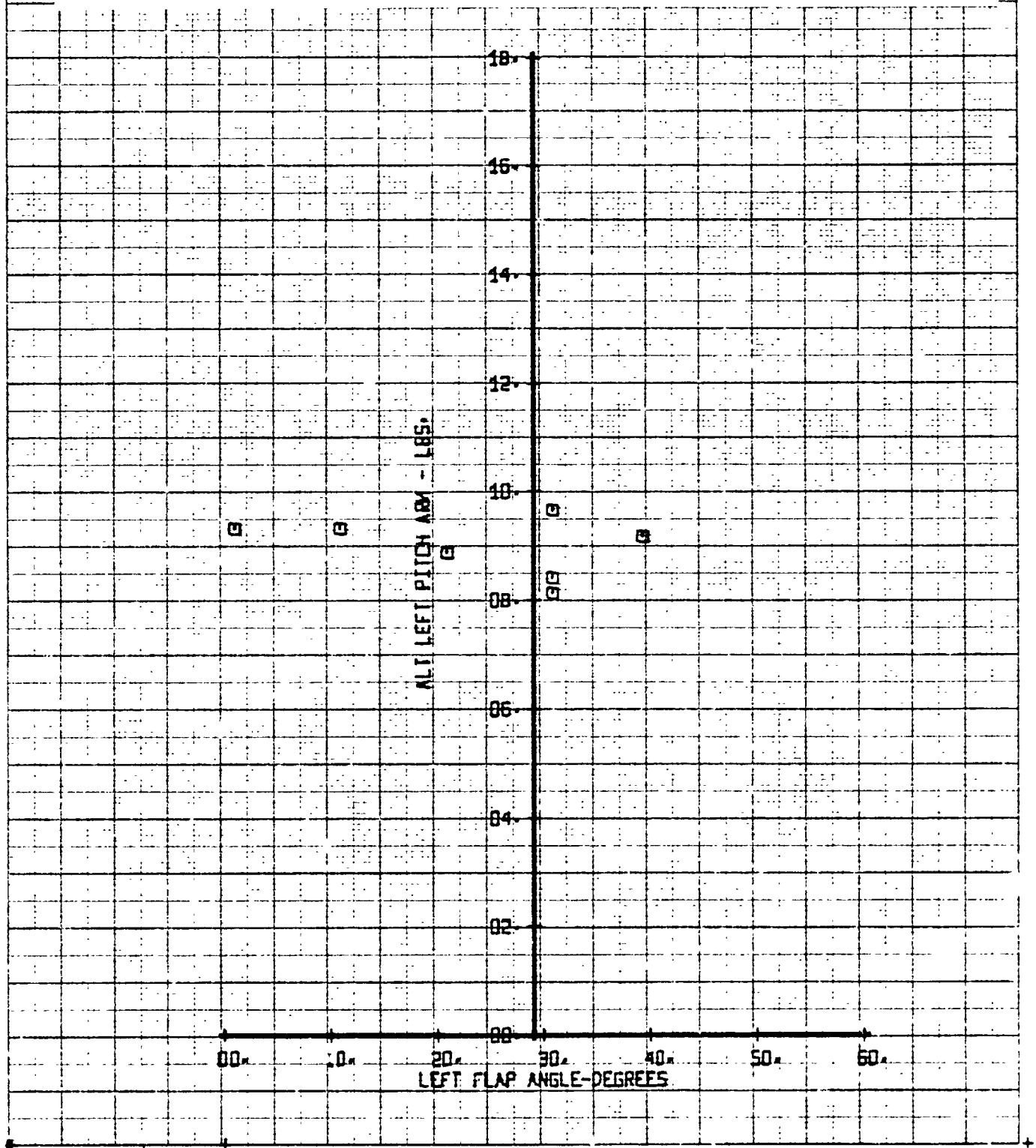
75
182

SET 75
BVWT 182

BVWT 182 VRD950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND						
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊕	116	30	180	-6	VARY

Figure 11-141. Alt. Left Pitch Link Load Versus Left Flap Angle ∿ Degrees. I_N = 30° Full Scale Airpseed 180 Knots.



FT 75
V 182

SET 75
BVWT 182

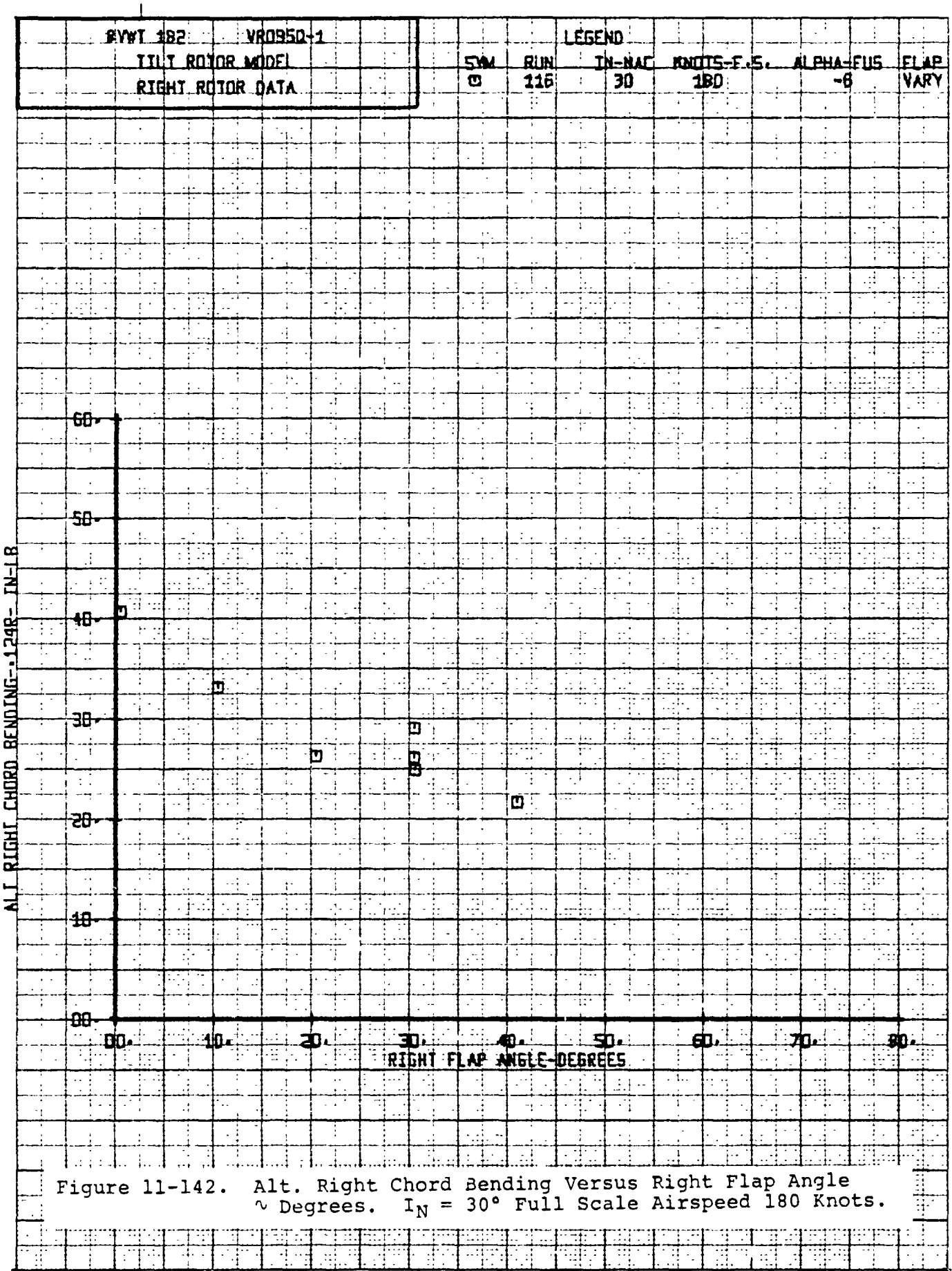
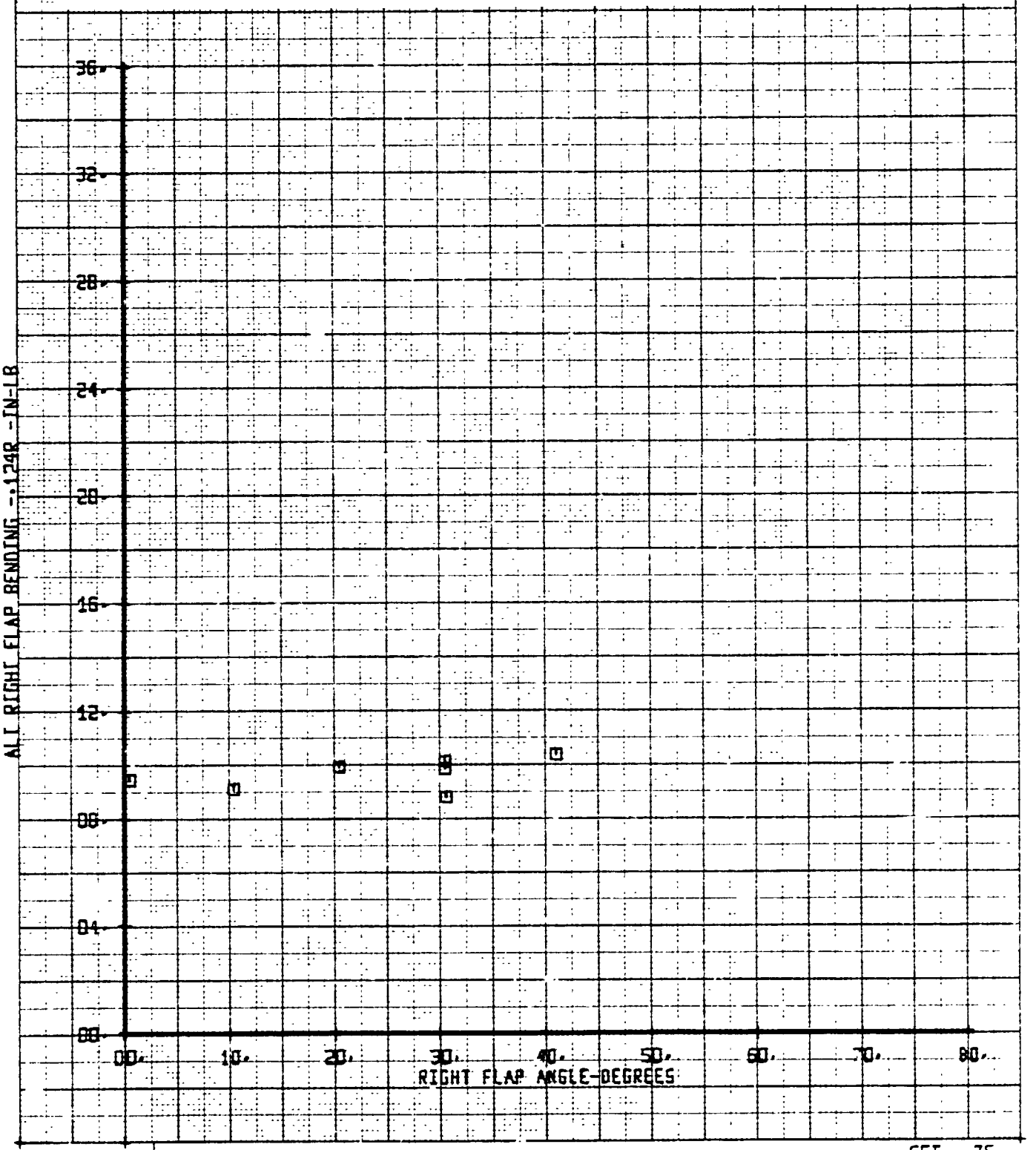


Figure 11-142. Alt. Right Chord Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	116	30	180	-6	VARY

Figure 11-143. Alt. Right Flap Bending Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.



SET 75
BVWT 182

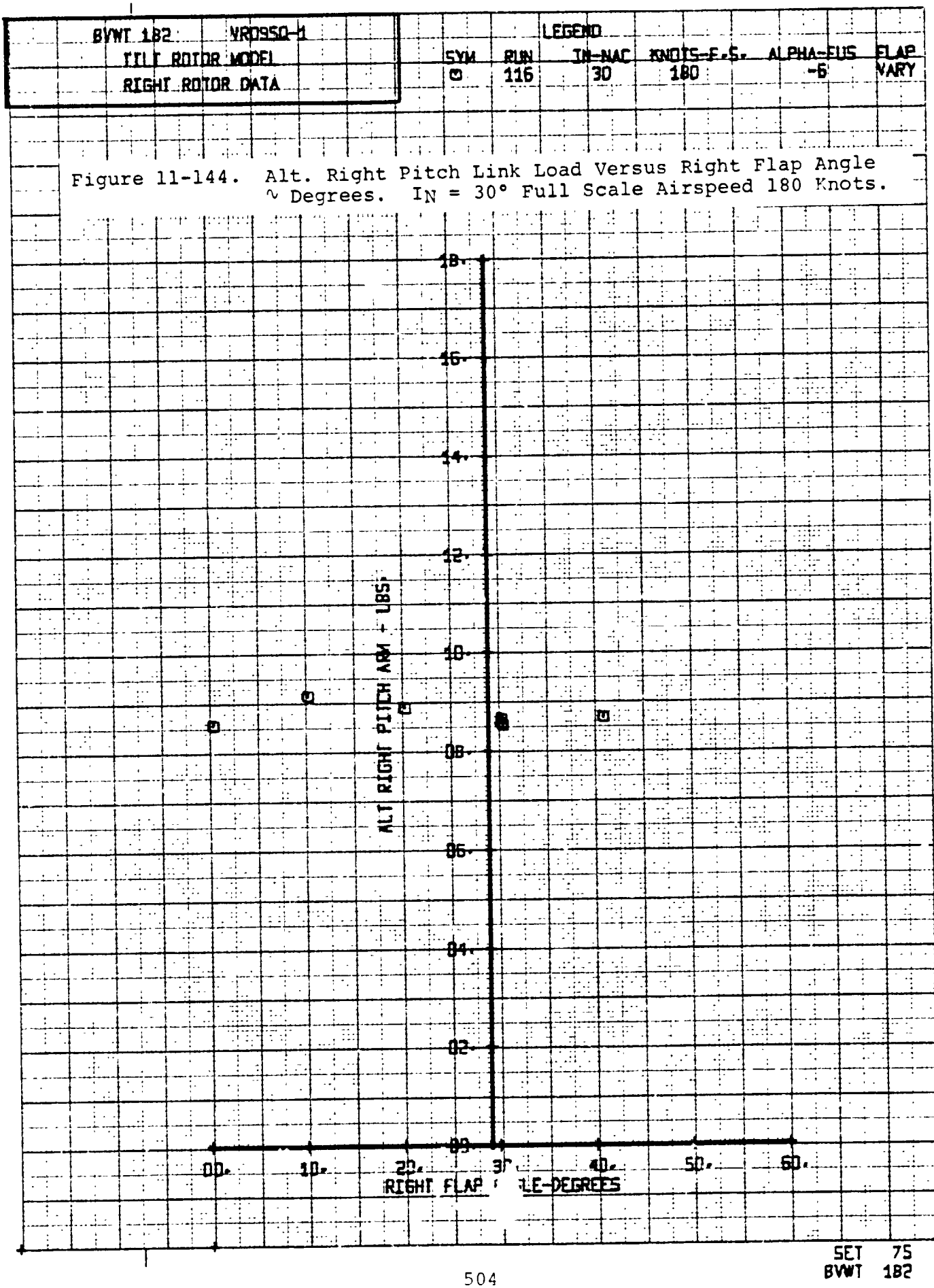


Figure 11-144. Alt. Right Pitch Link Load Versus Right Flap Angle ∿ Degrees. I_N = 30° Full Scale Airspeed 180 Knots.

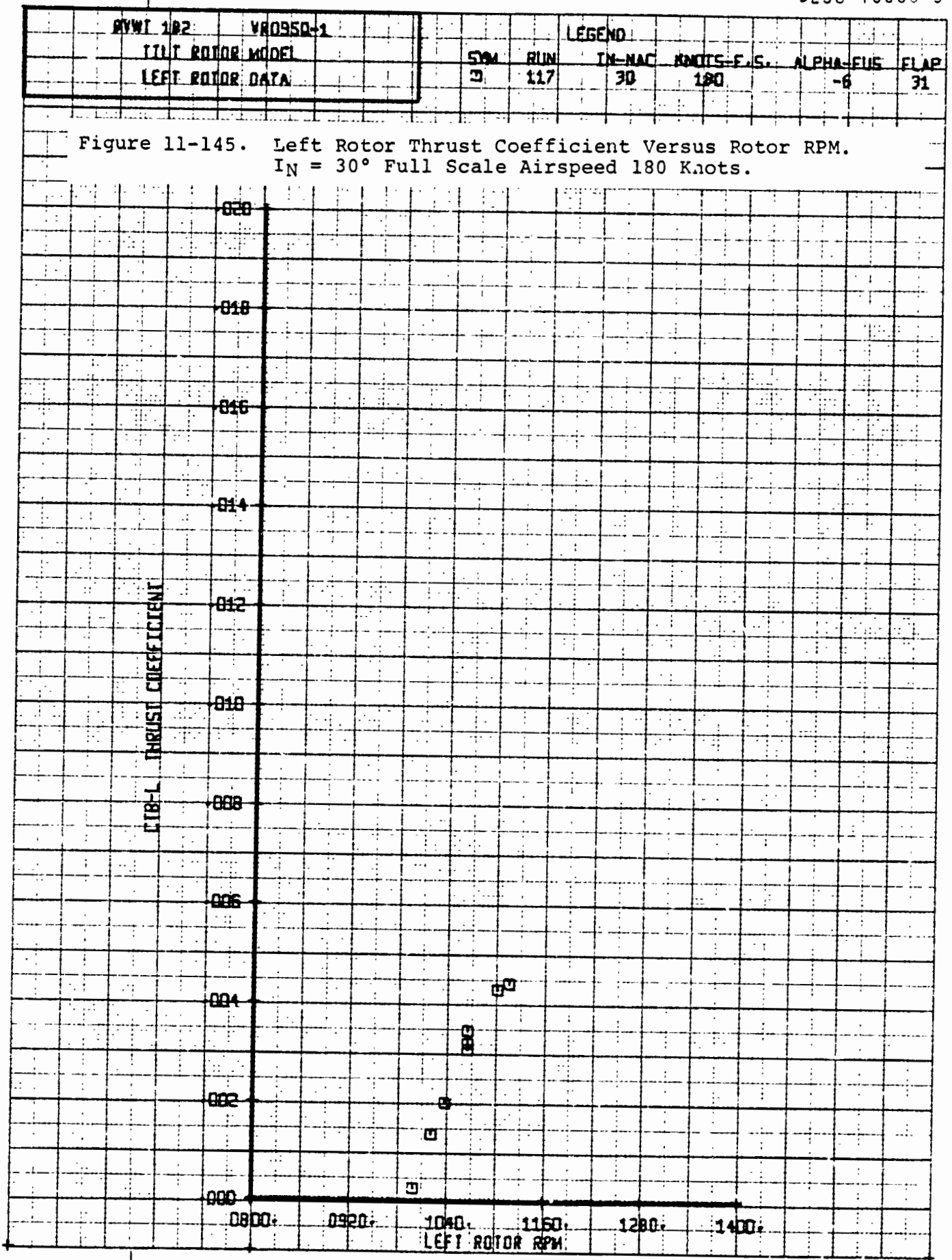


Figure 11-145. Left Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

ET 76
W 182

SET 75
BVWT 182

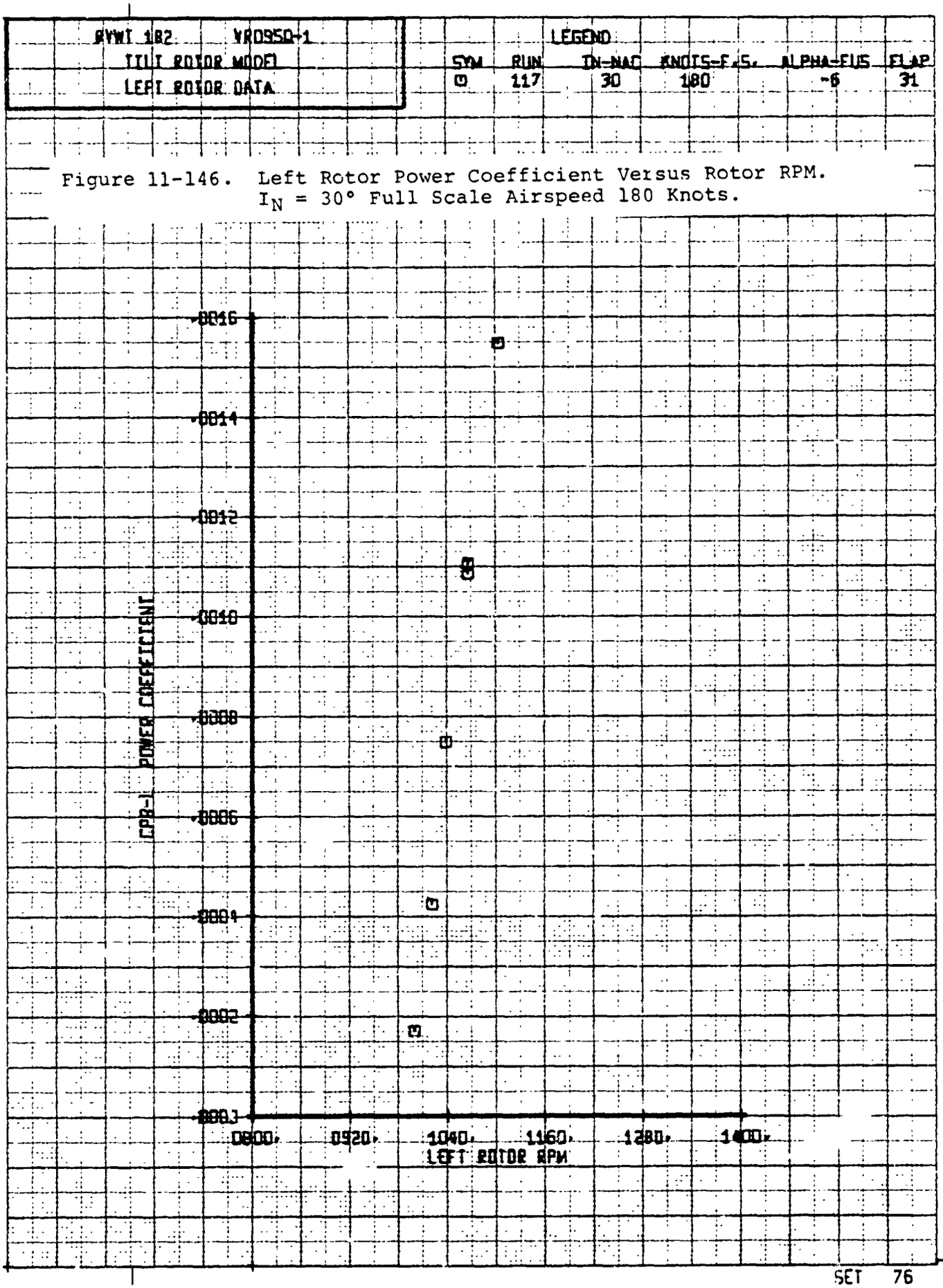


Figure 11-146. Left Rotor Power Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

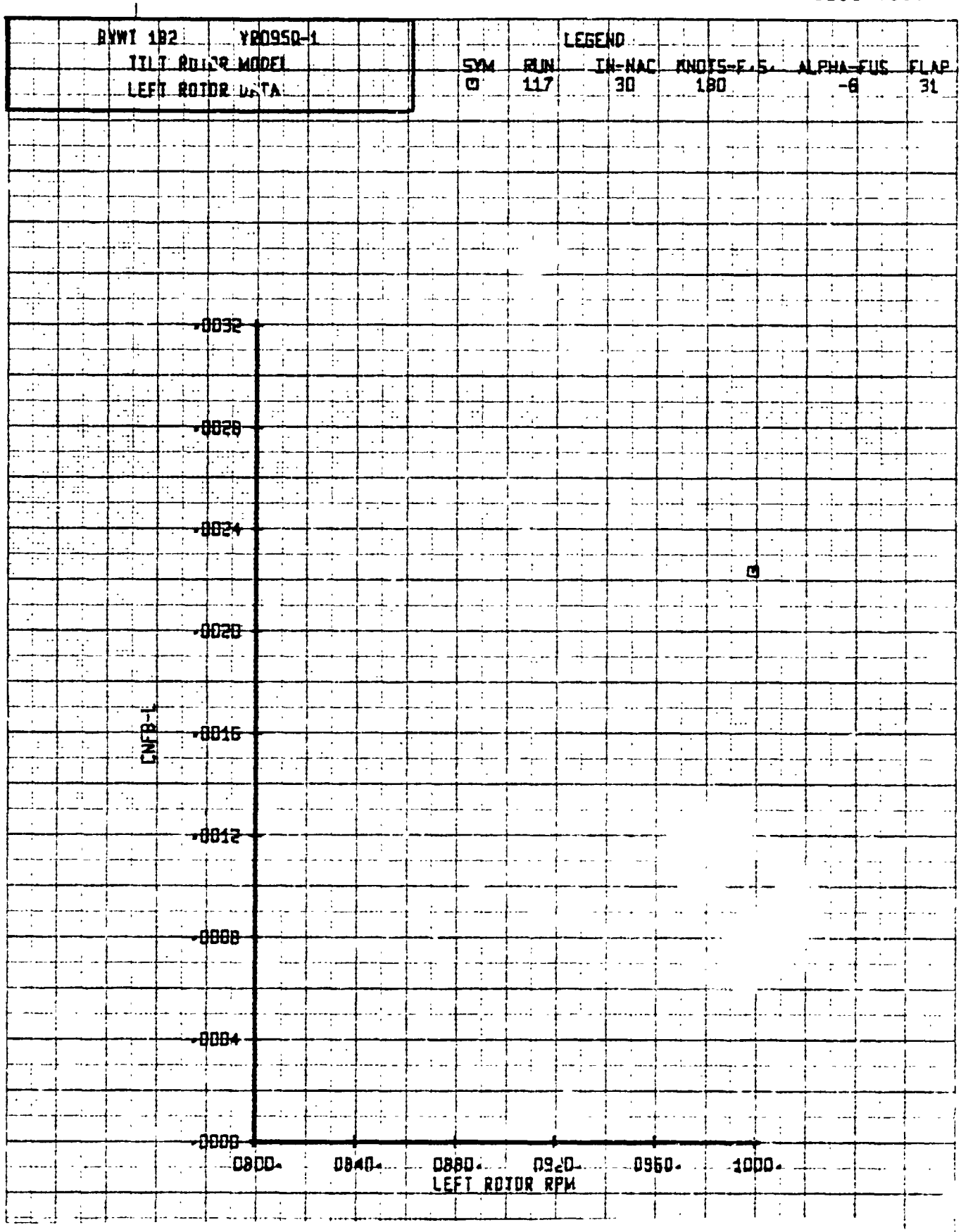


Figure 11-147. Left Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

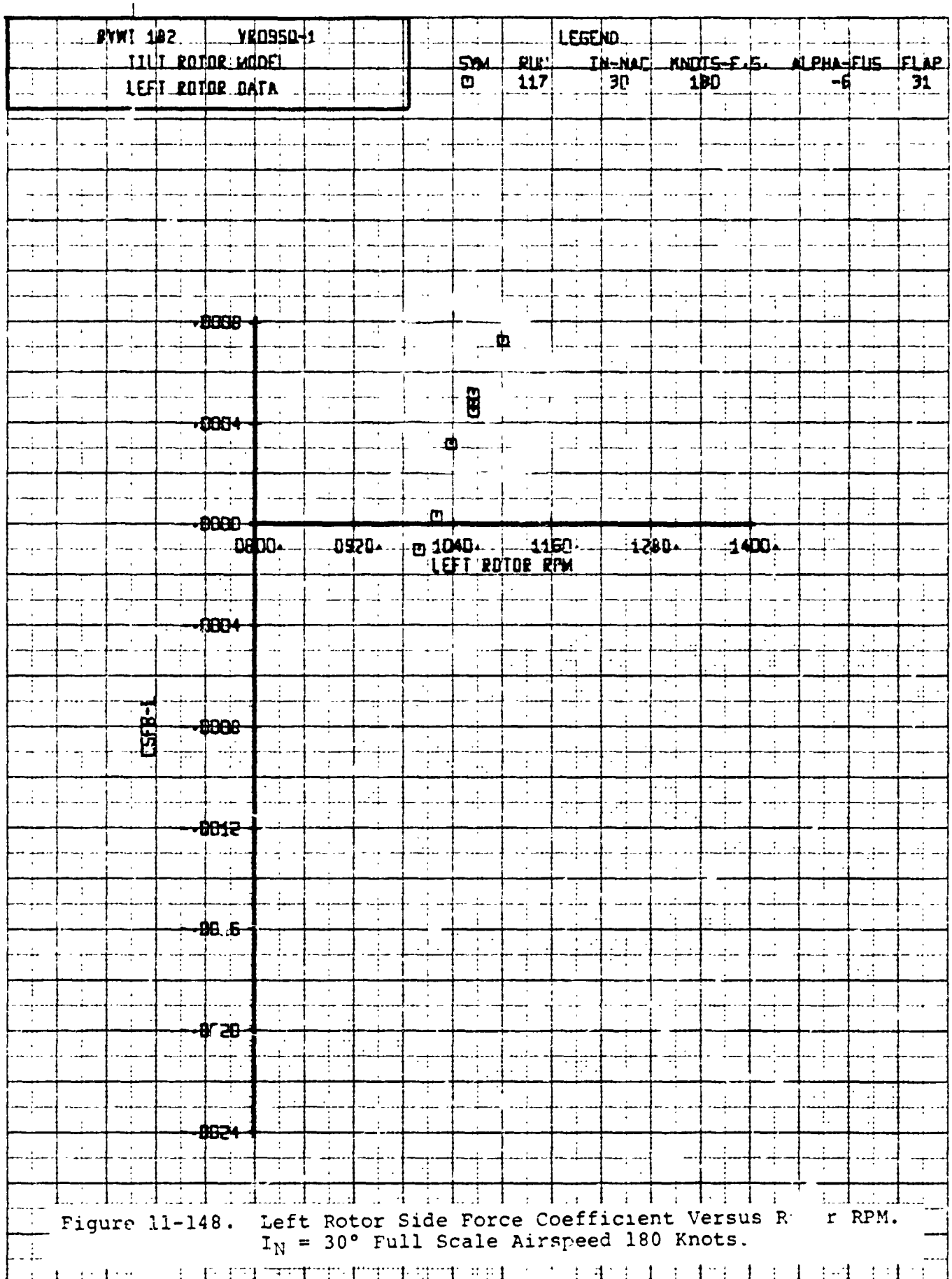


Figure 11-148. Left Rotor Side Force Coefficient Versus R r RPM. I_N = 30° Full Scale Airspeed 180 Knots.

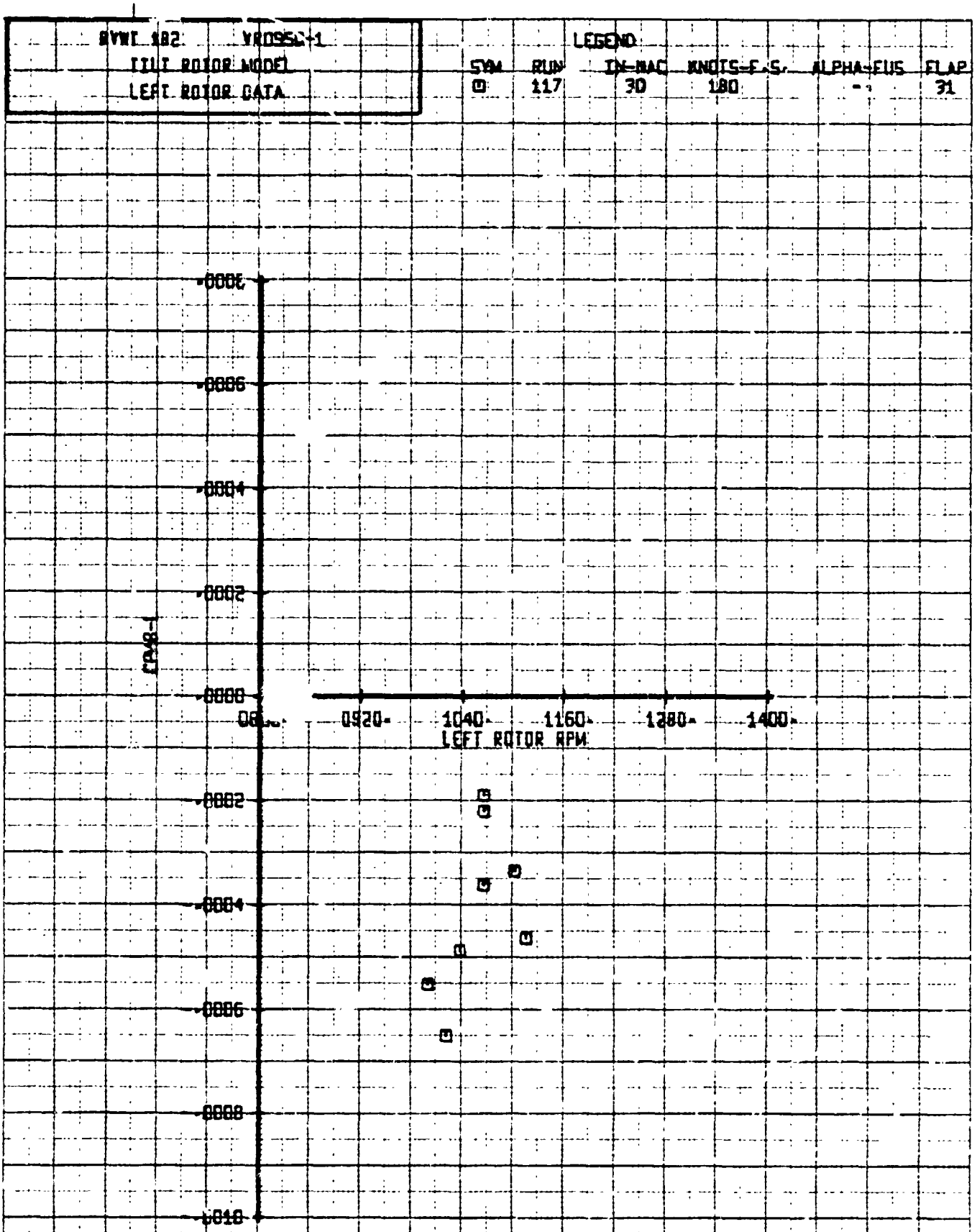


Figure 11-149. Left Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

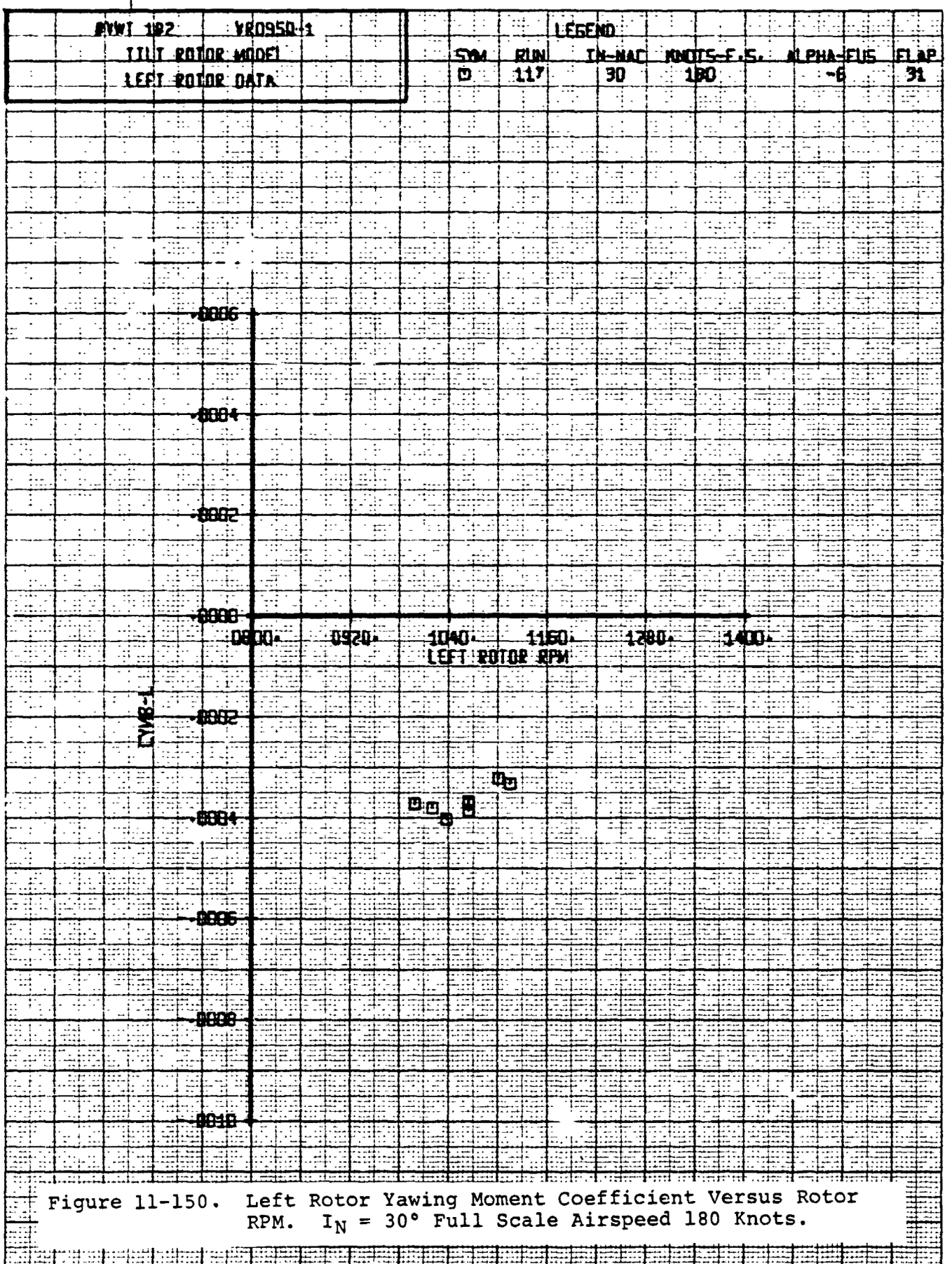


Figure 11-150. Left Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

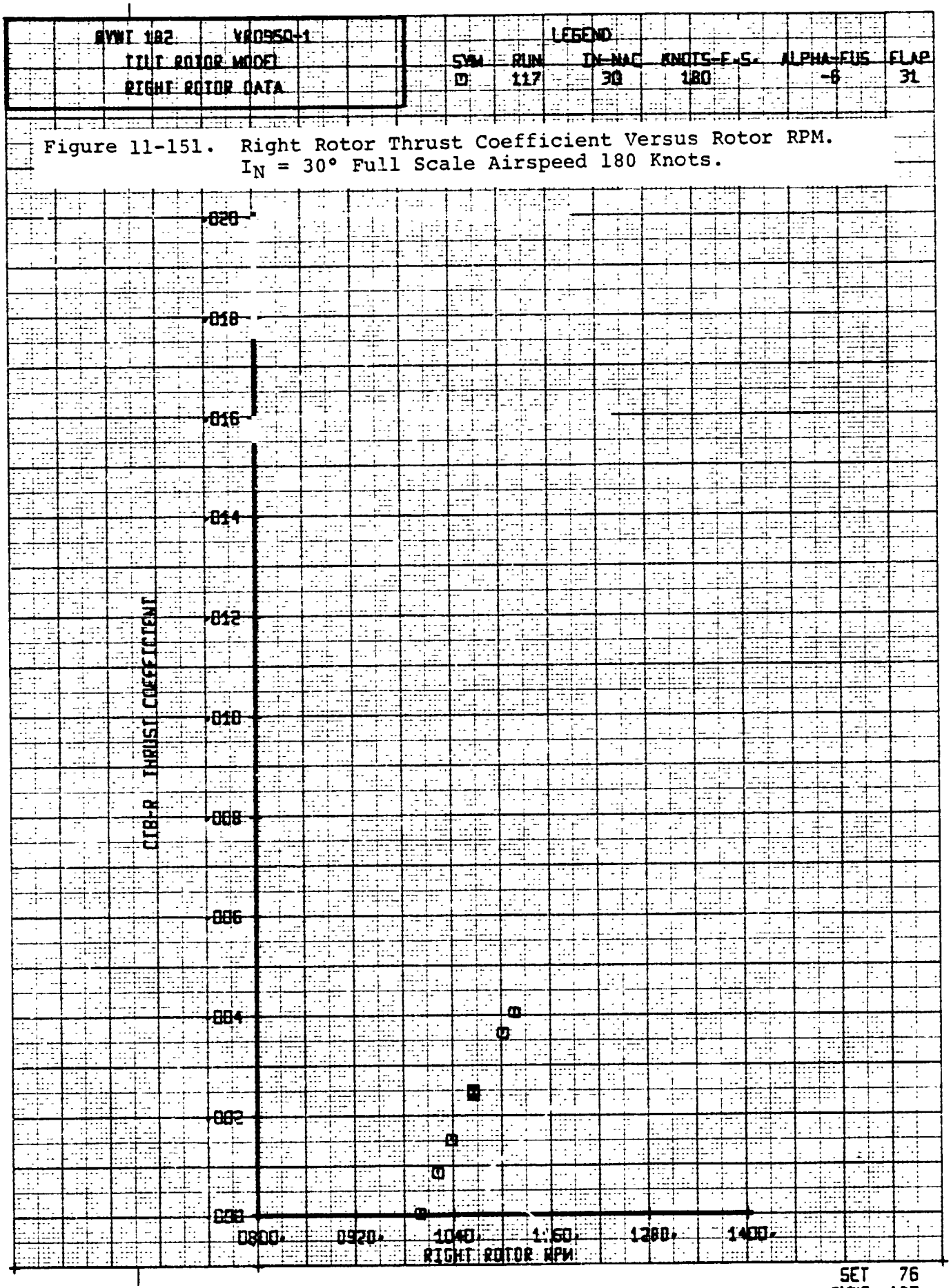


Figure 11-151. Right Rotor Thrust Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

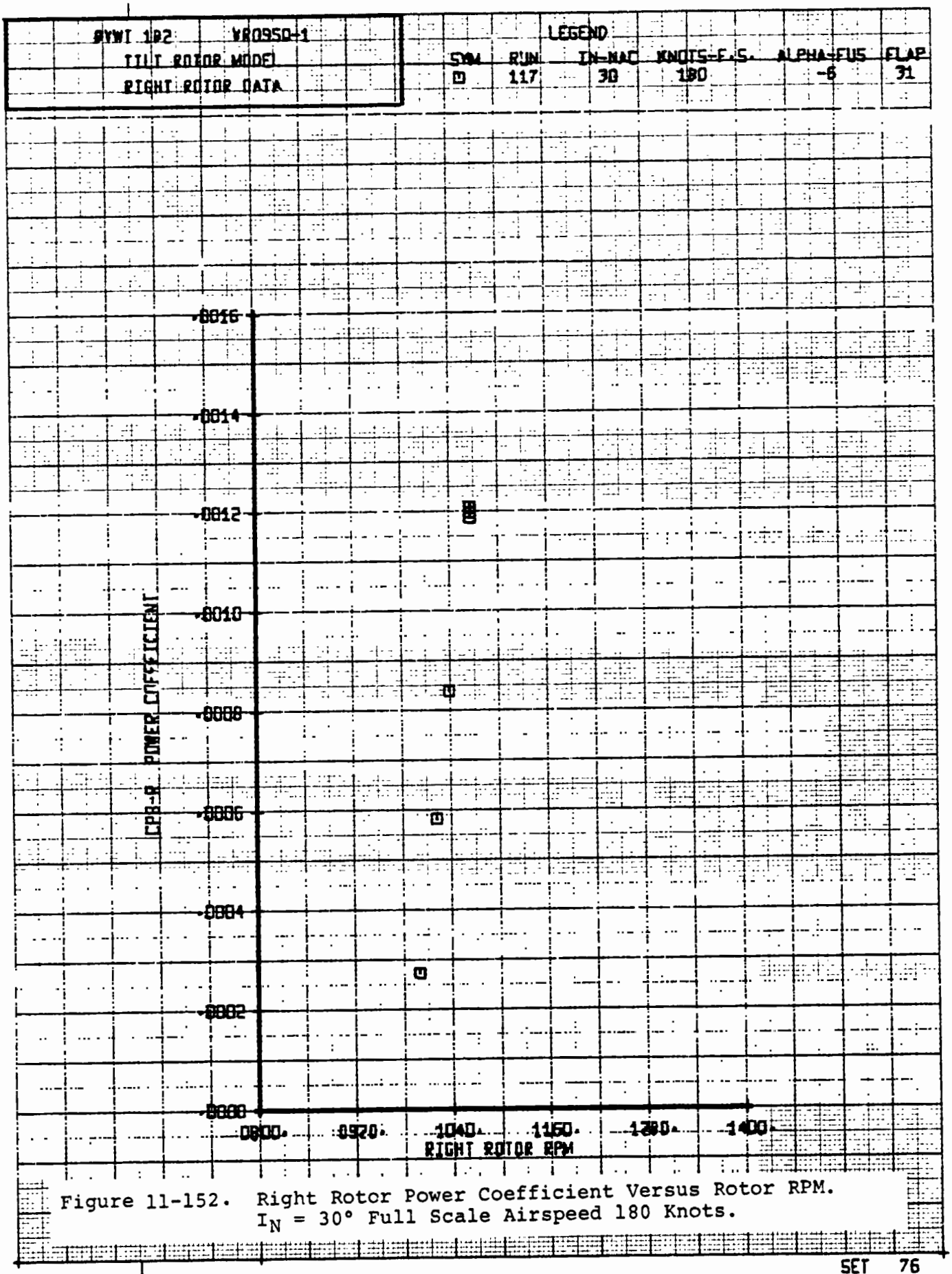


Figure 11-152. Right Rotor Power Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

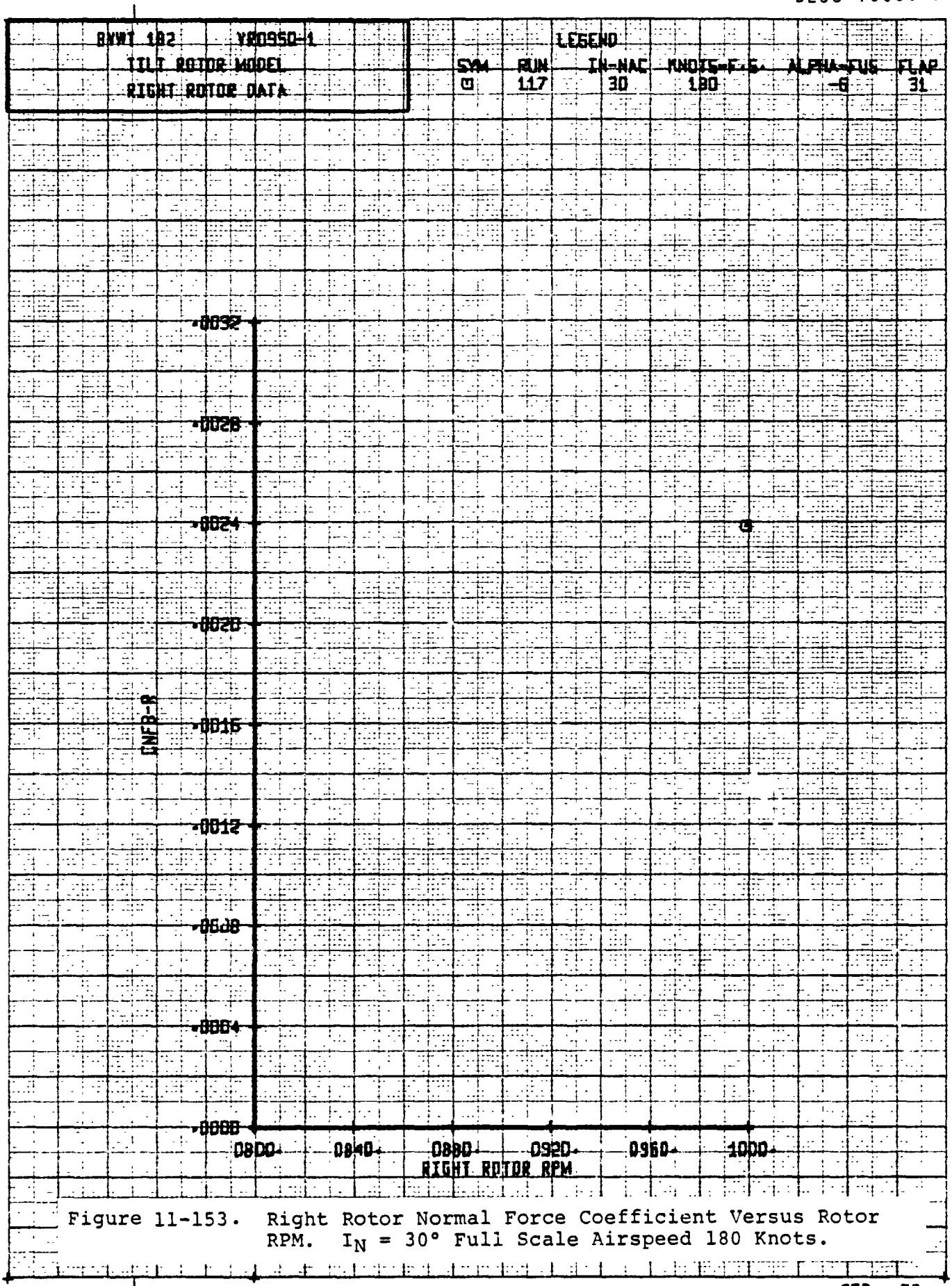


Figure 11-153. Right Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

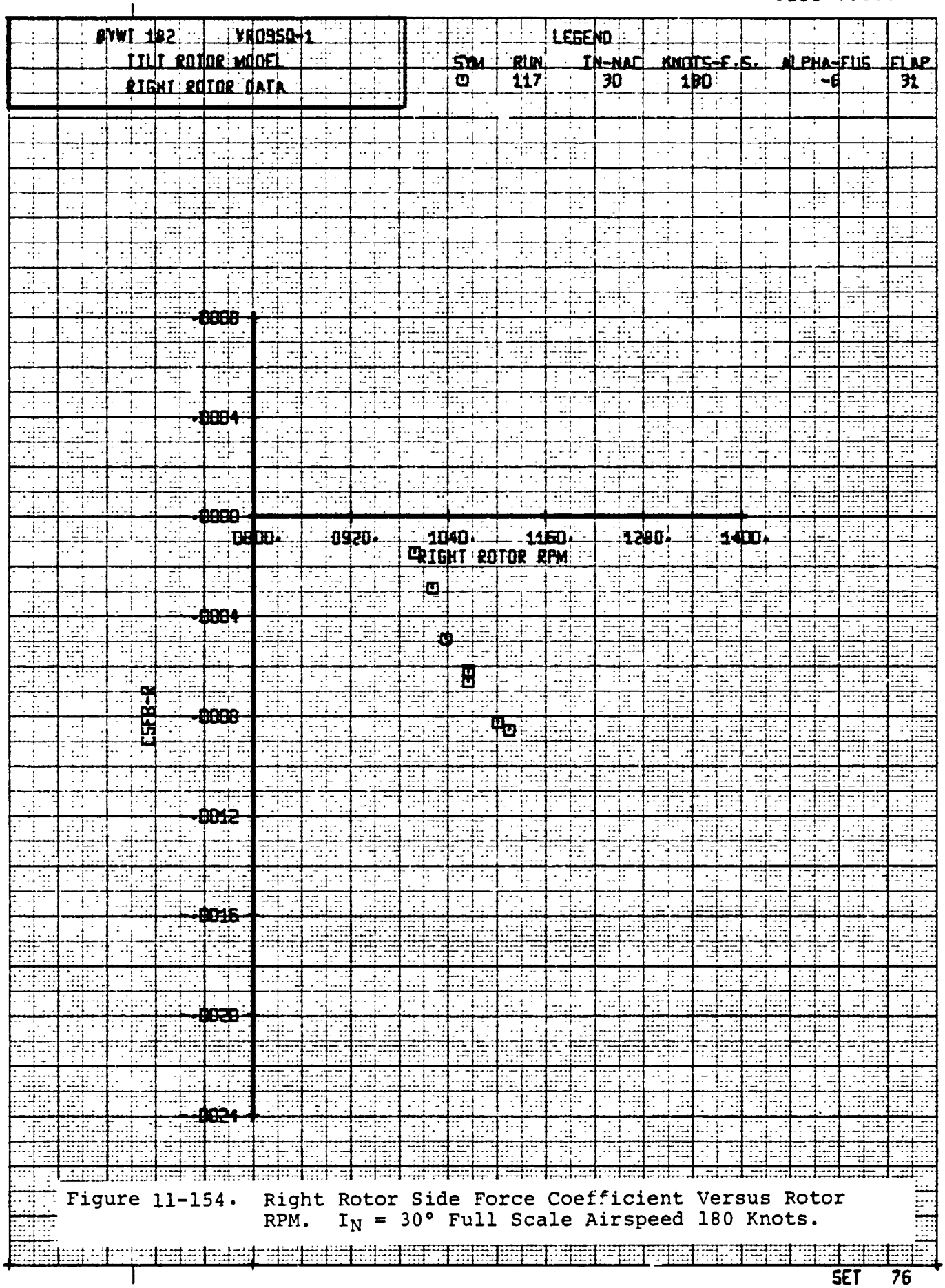


Figure 11-154. Right Rotor Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

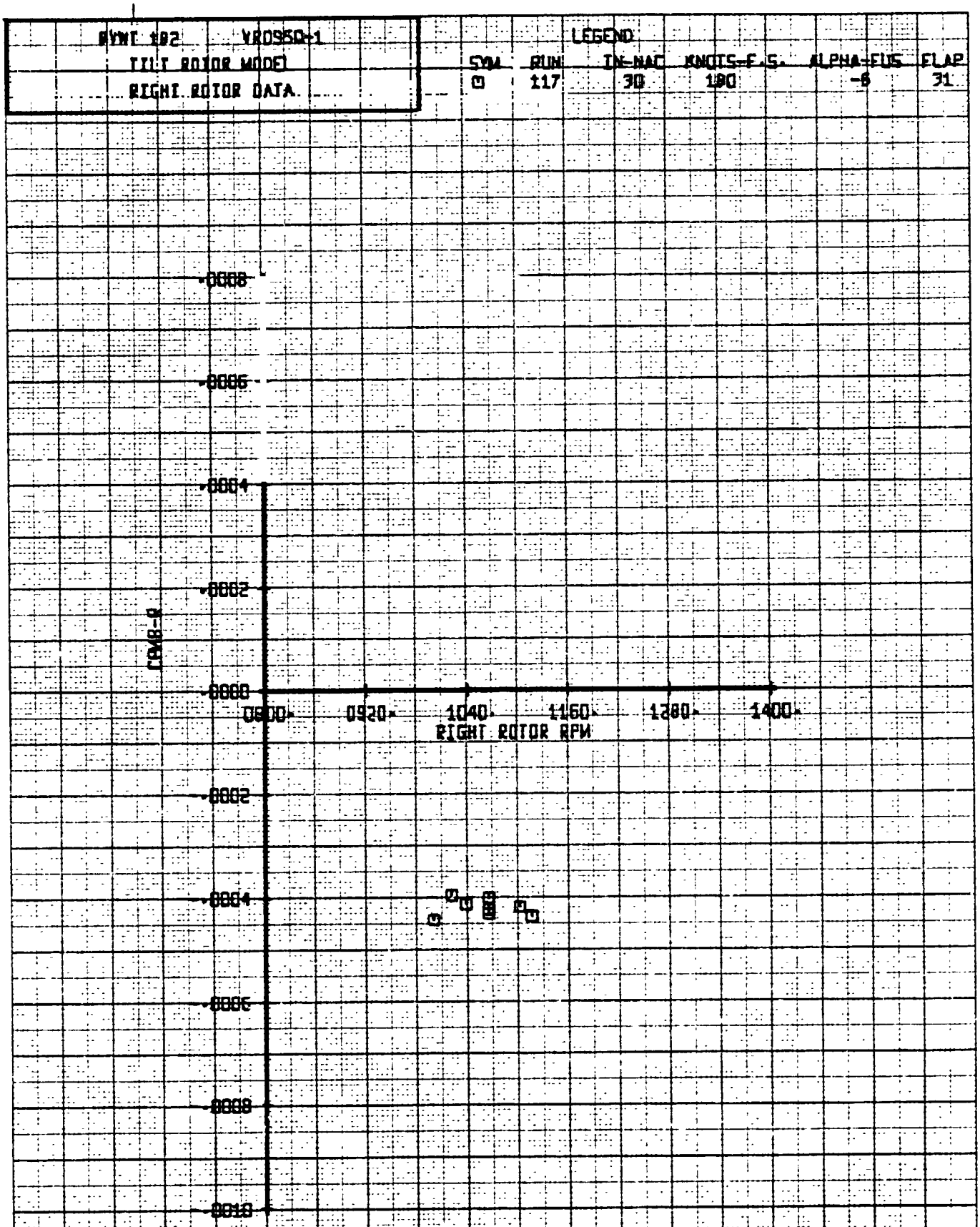


Figure 11-155. Right Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

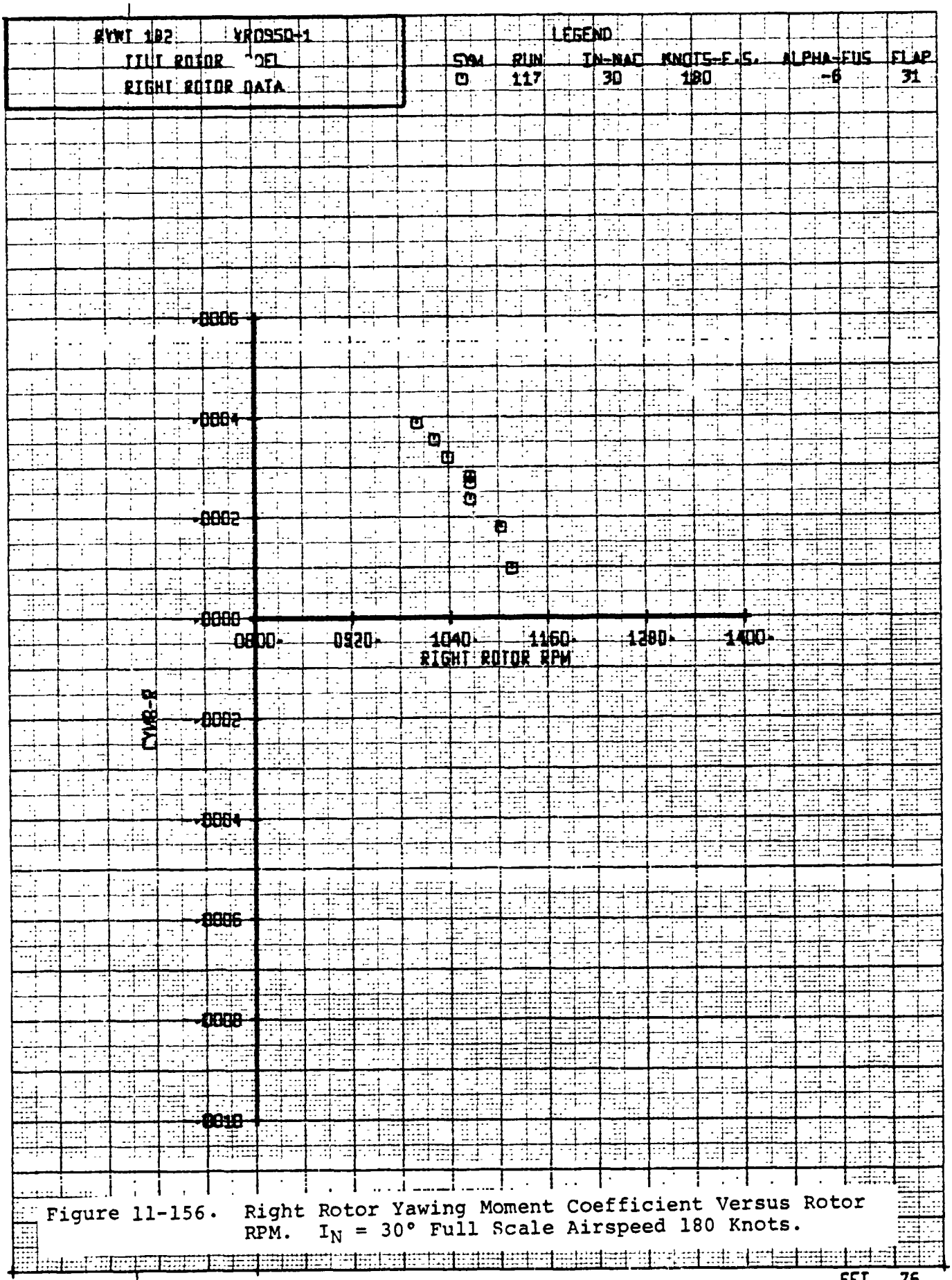


Figure 11-156. Right Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

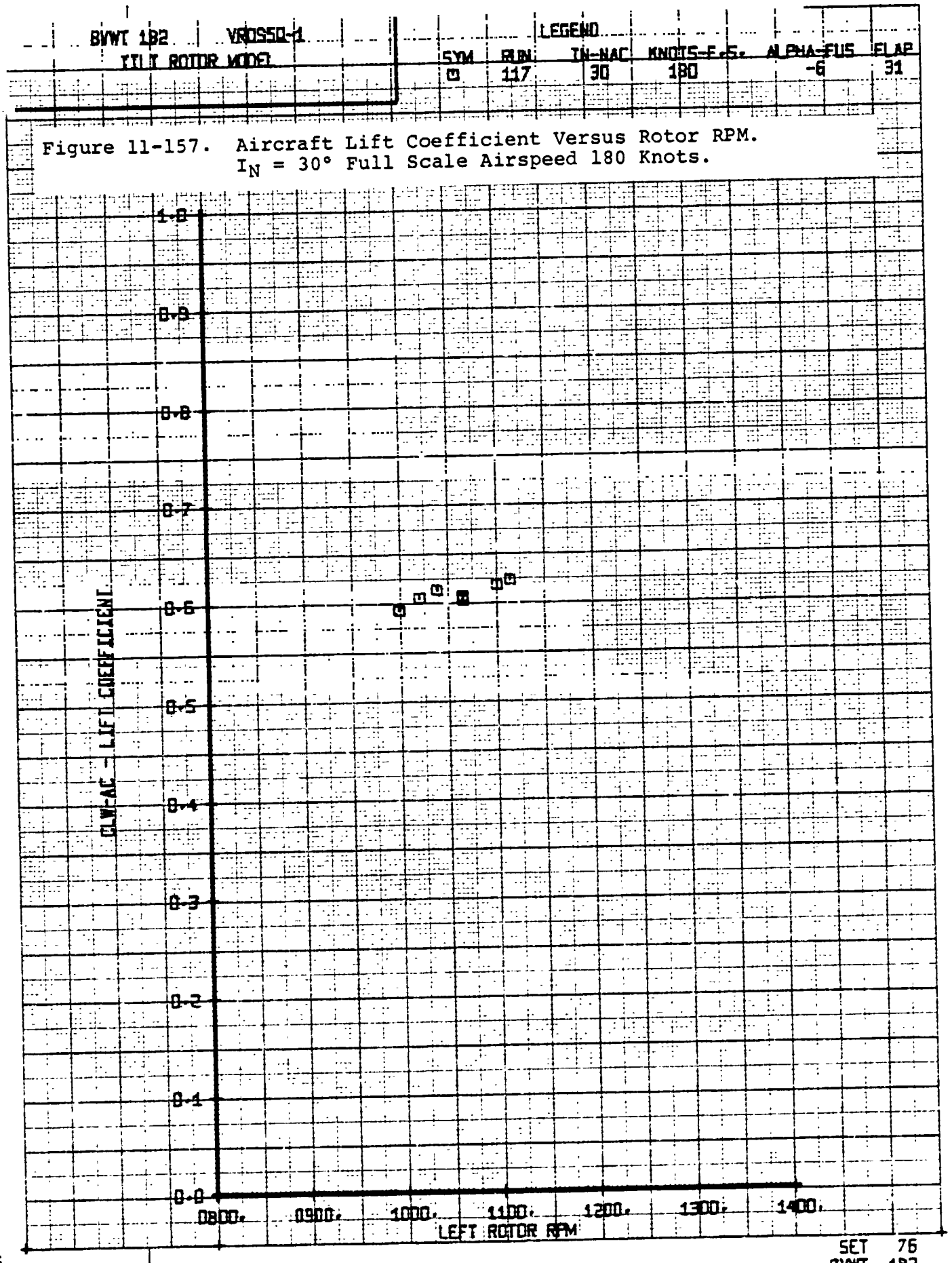


Figure 11-157. Aircraft Lift Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

FT 76
V 182

SET 76
BWWT 182

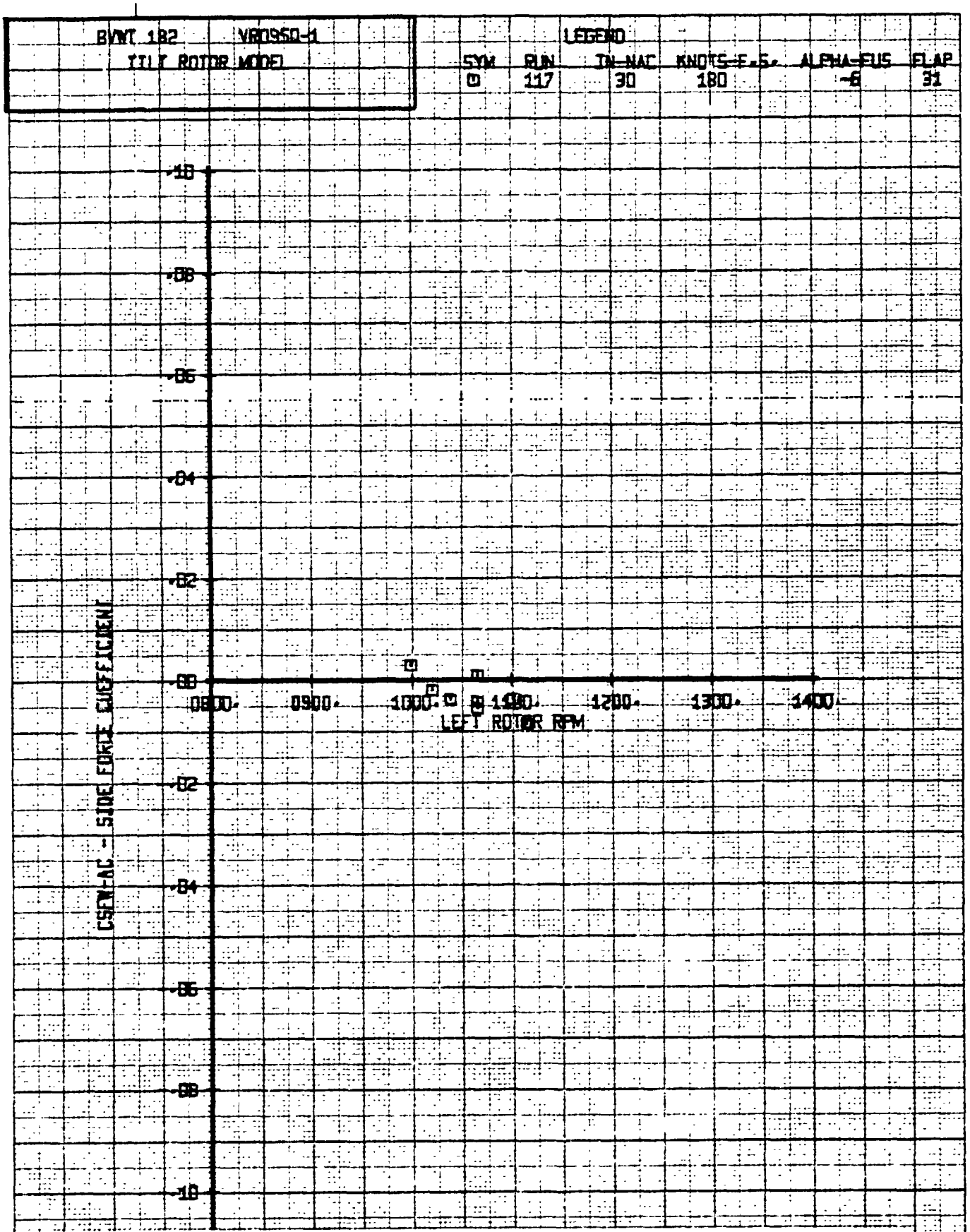


Figure 11-158. Aircraft Side Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

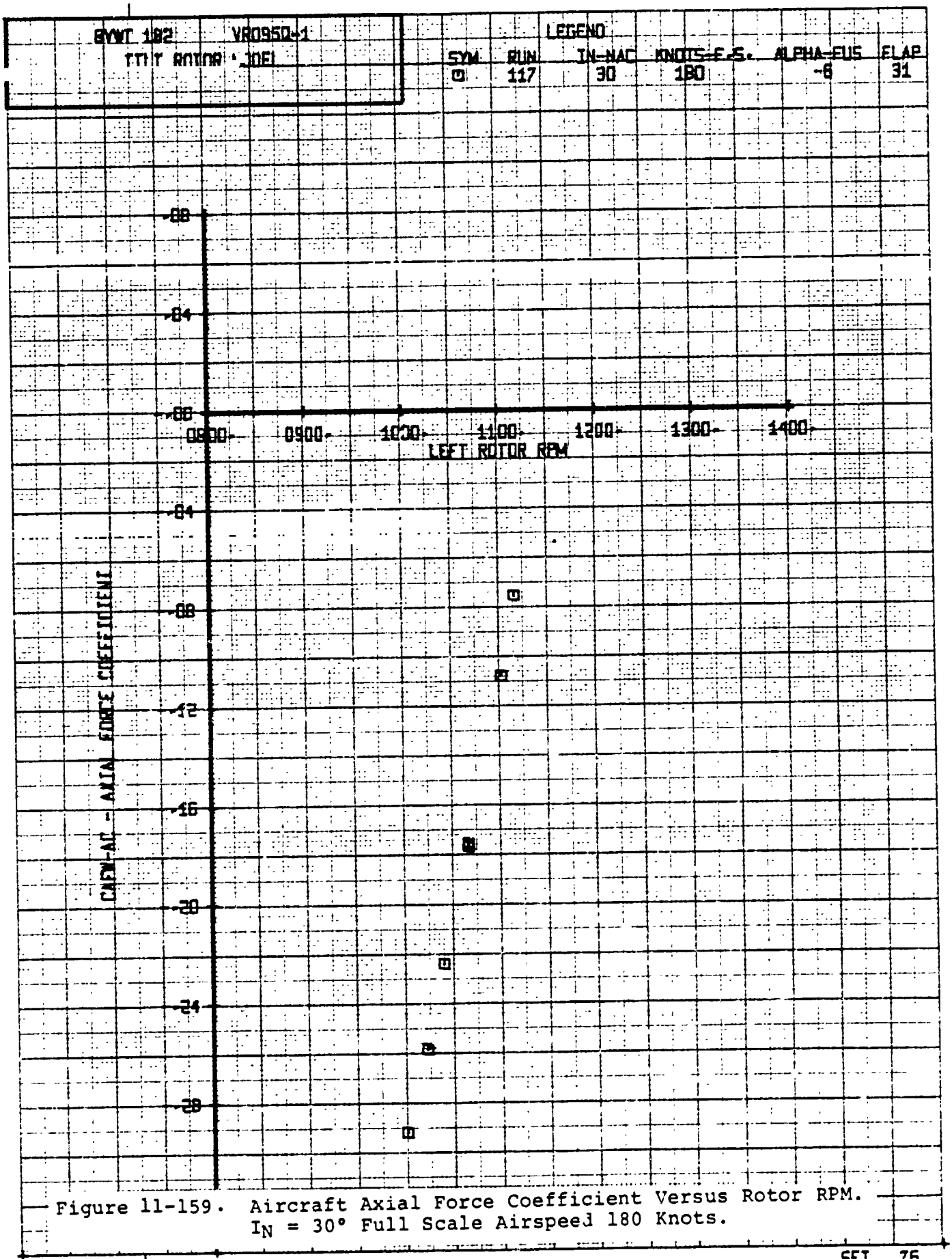


Figure 11-159. Aircraft Axial Force Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

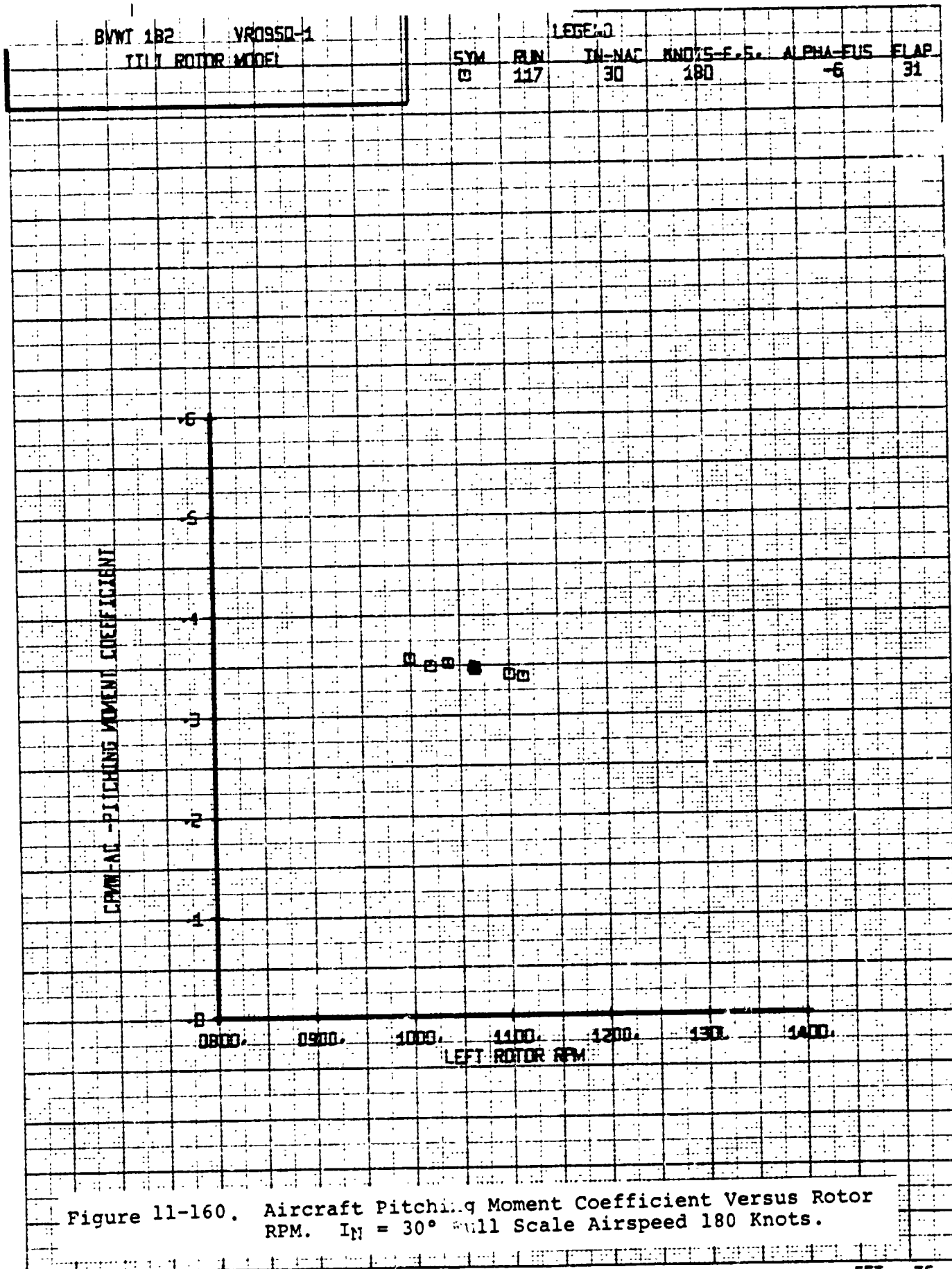


Figure 11-160. Aircraft Pitching Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

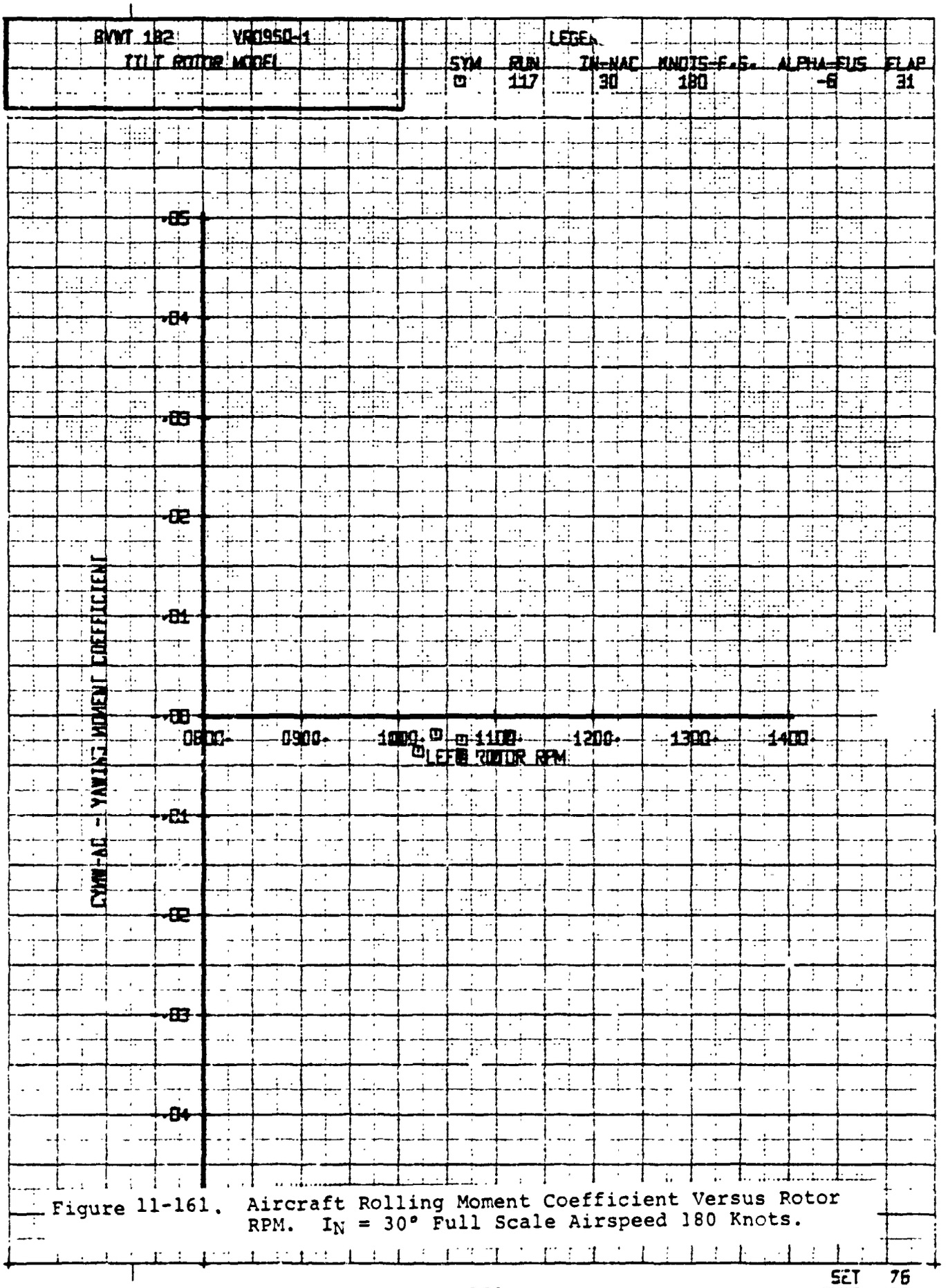


Figure 11-161. Aircraft Rolling Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

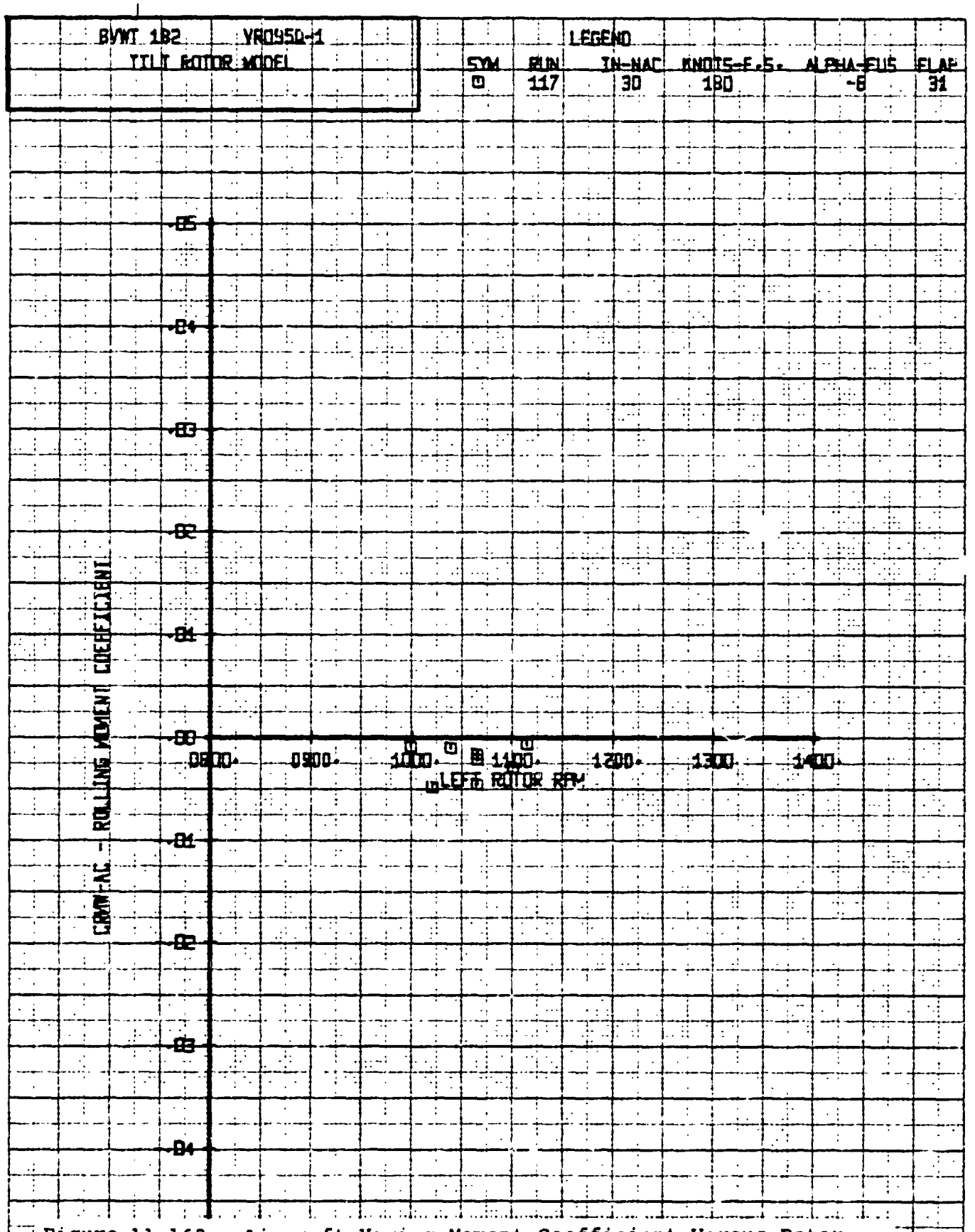


Figure 11-162. Aircraft Yawing Moment Coefficient Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

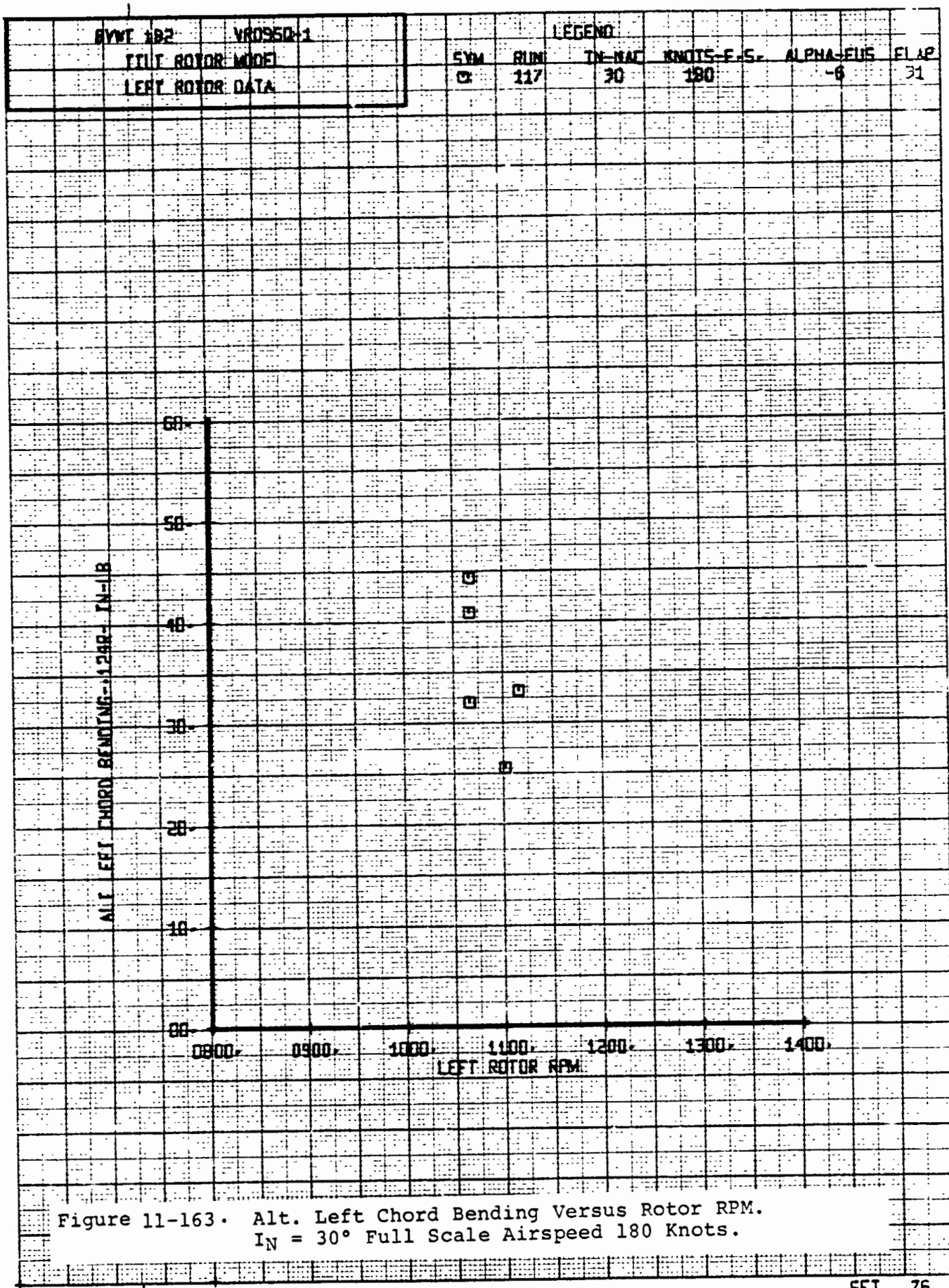
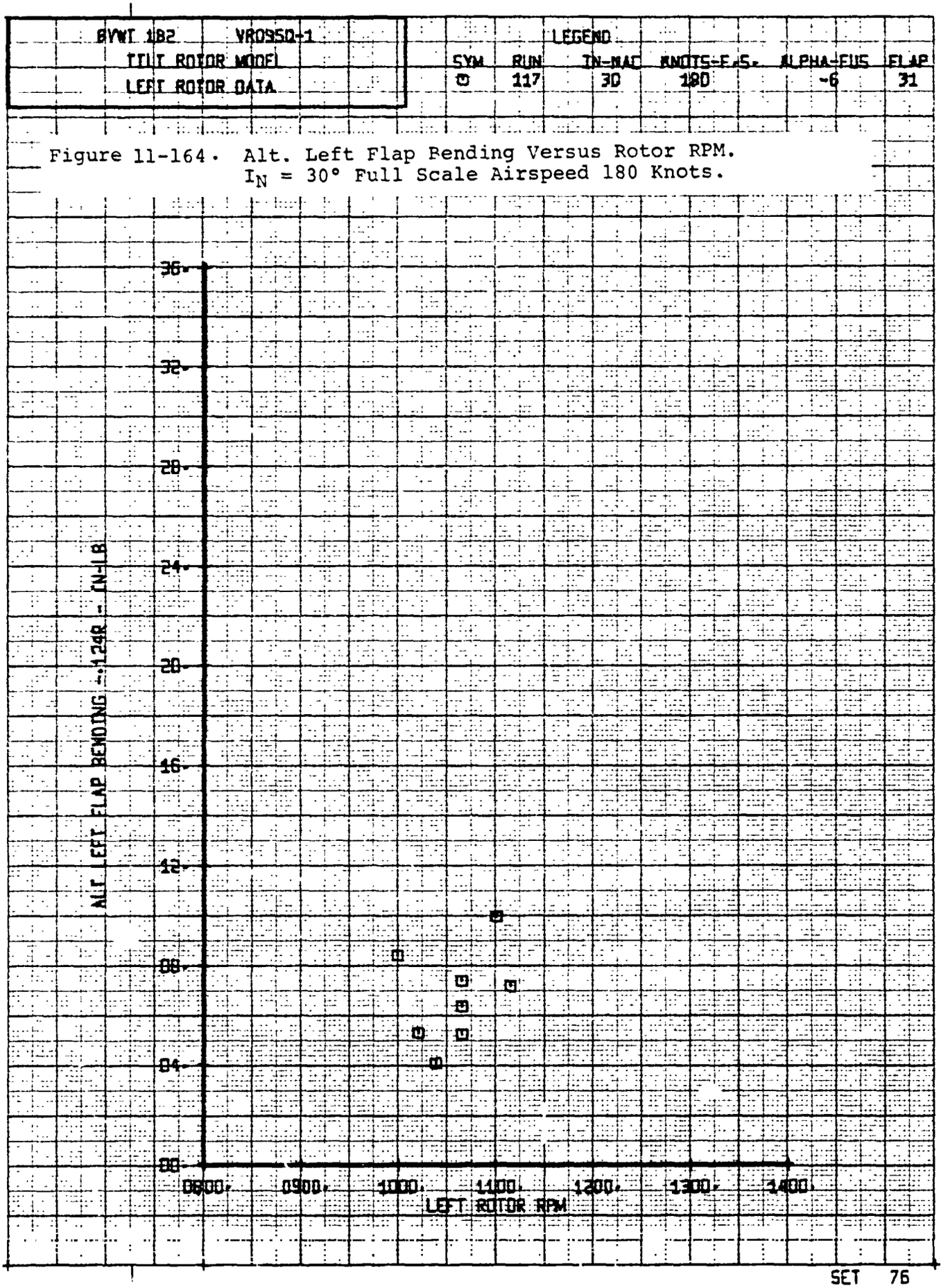


Figure 11-163. Alt. Left Chord Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	117	30	180	-6	31

Figure 11-164. Alt. Left Flap Bending Versus Rotor RPM.
I_N = 30° Full Scale Airspeed 180 Knots.



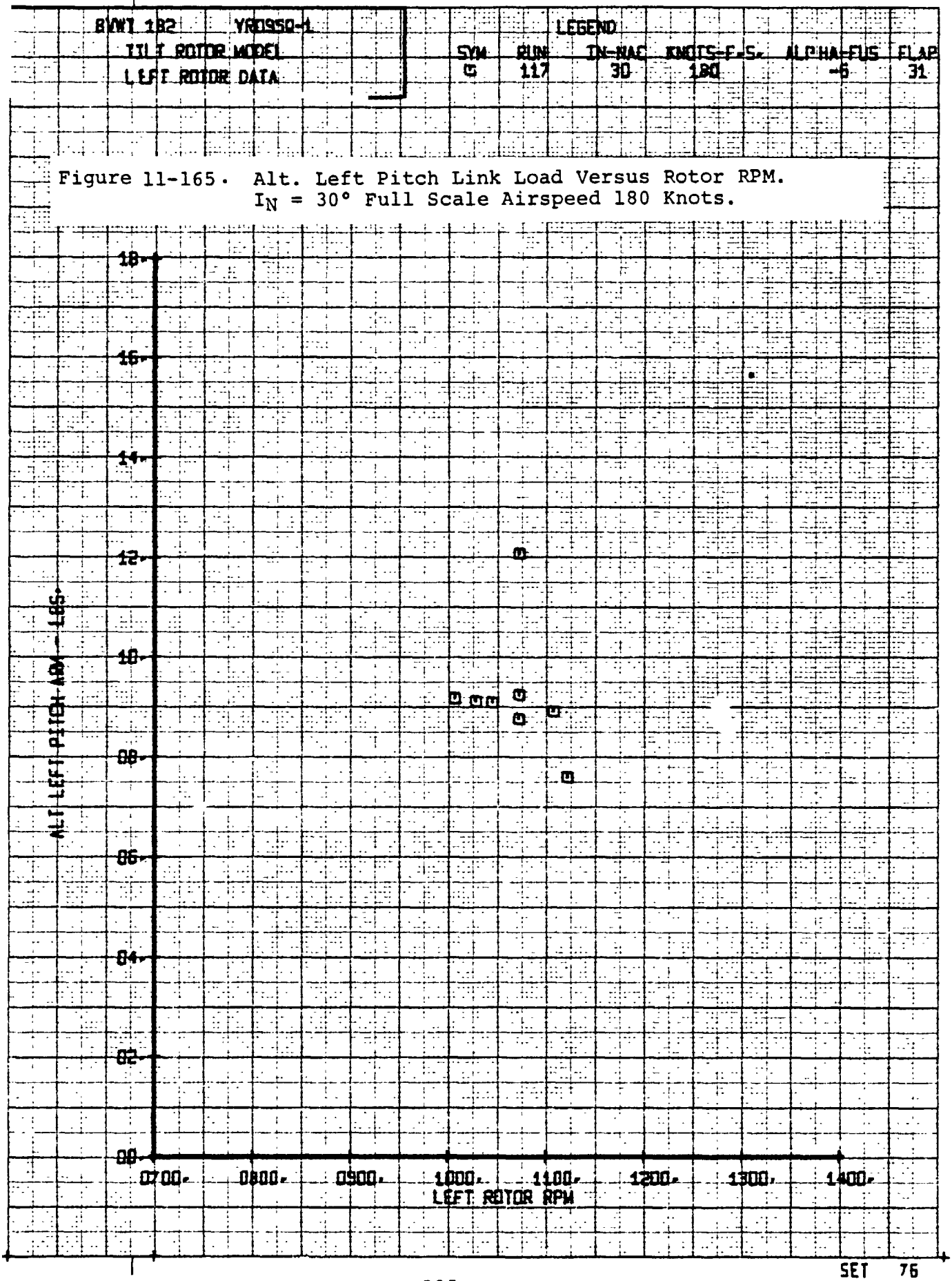


Figure 11-165. Alt. Left Pitch Link Load Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

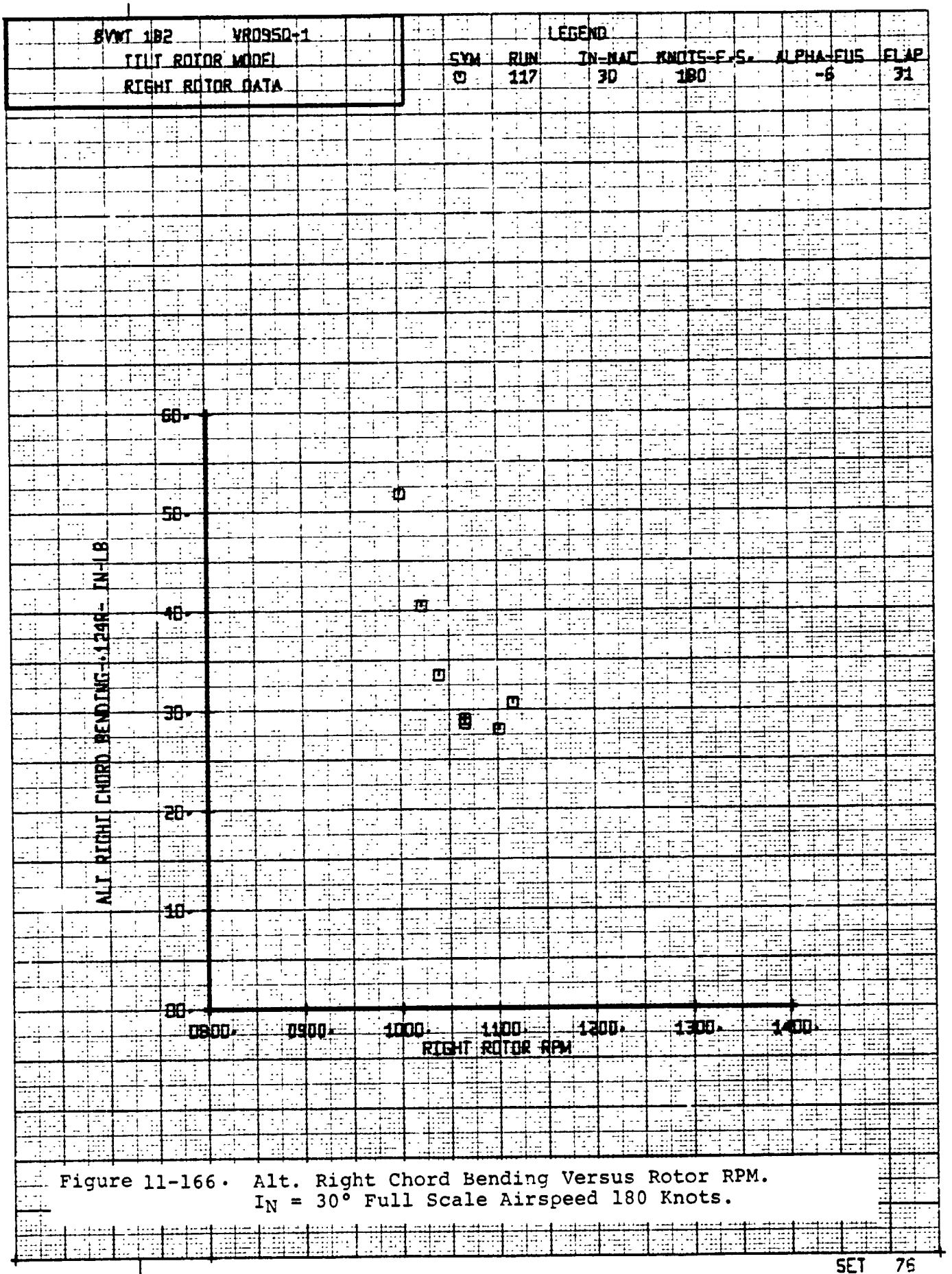


Figure 11-166. Alt. Right Chord Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

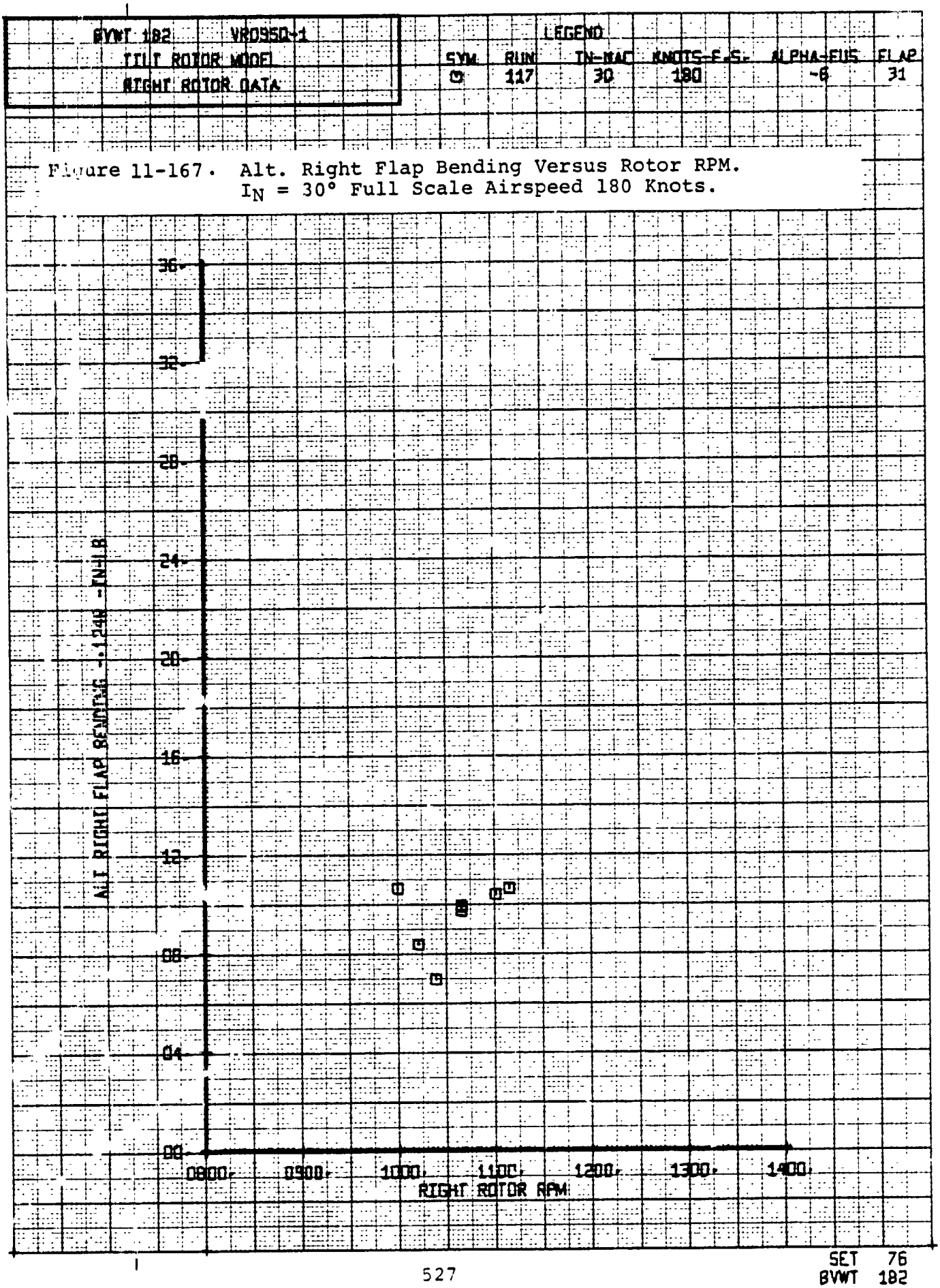


Figure 11-167. Alt. Right Flap Bending Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

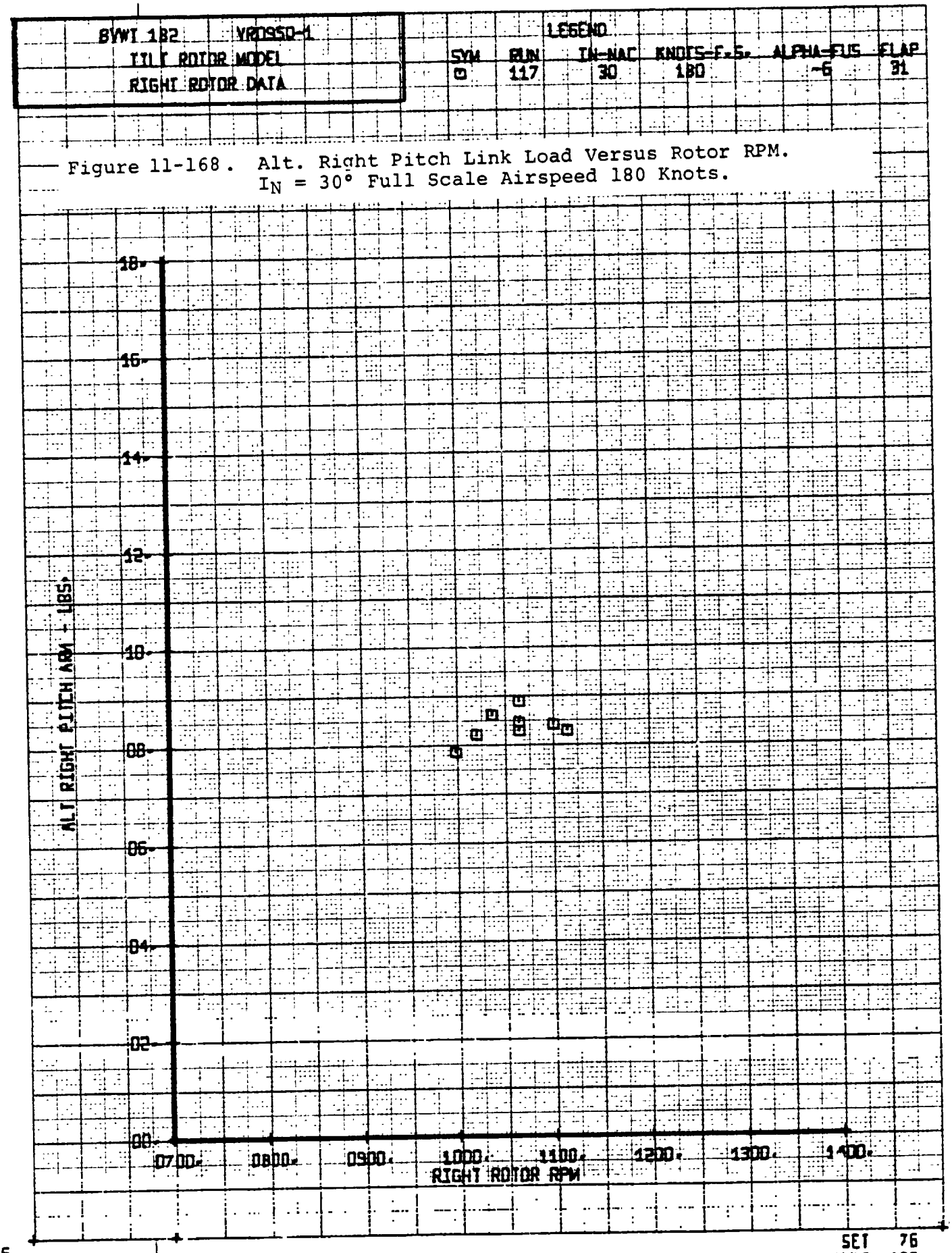
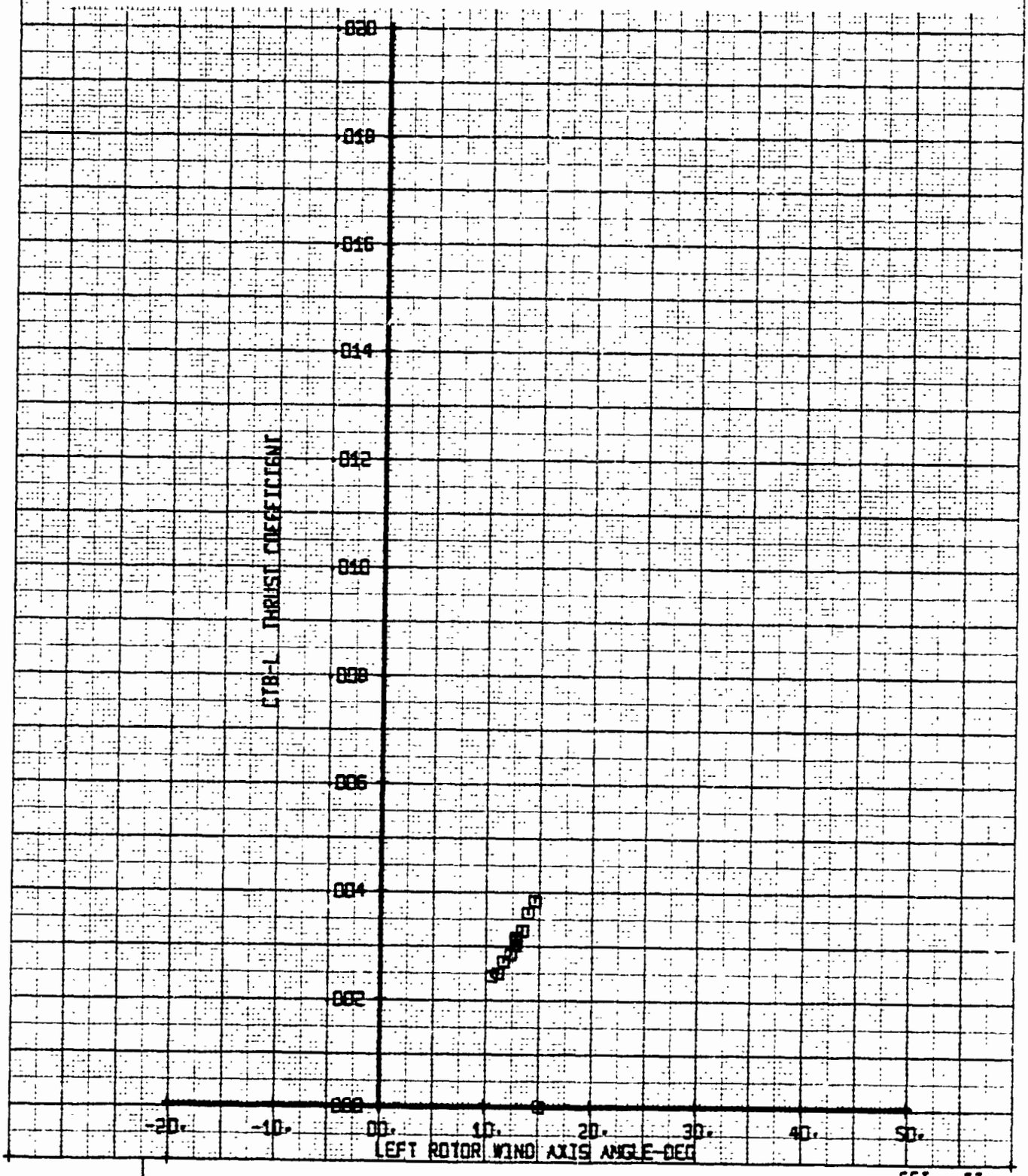


Figure 11-168. Alt. Right Pitch Link Load Versus Rotor RPM. I_N = 30° Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1 TILT ROTOR MODEL LEFT ROTOR DATA	LEGEND SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
	⊙	118	15	180	VARY	20

Figure 12-001. Left Rotor Thrust Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.



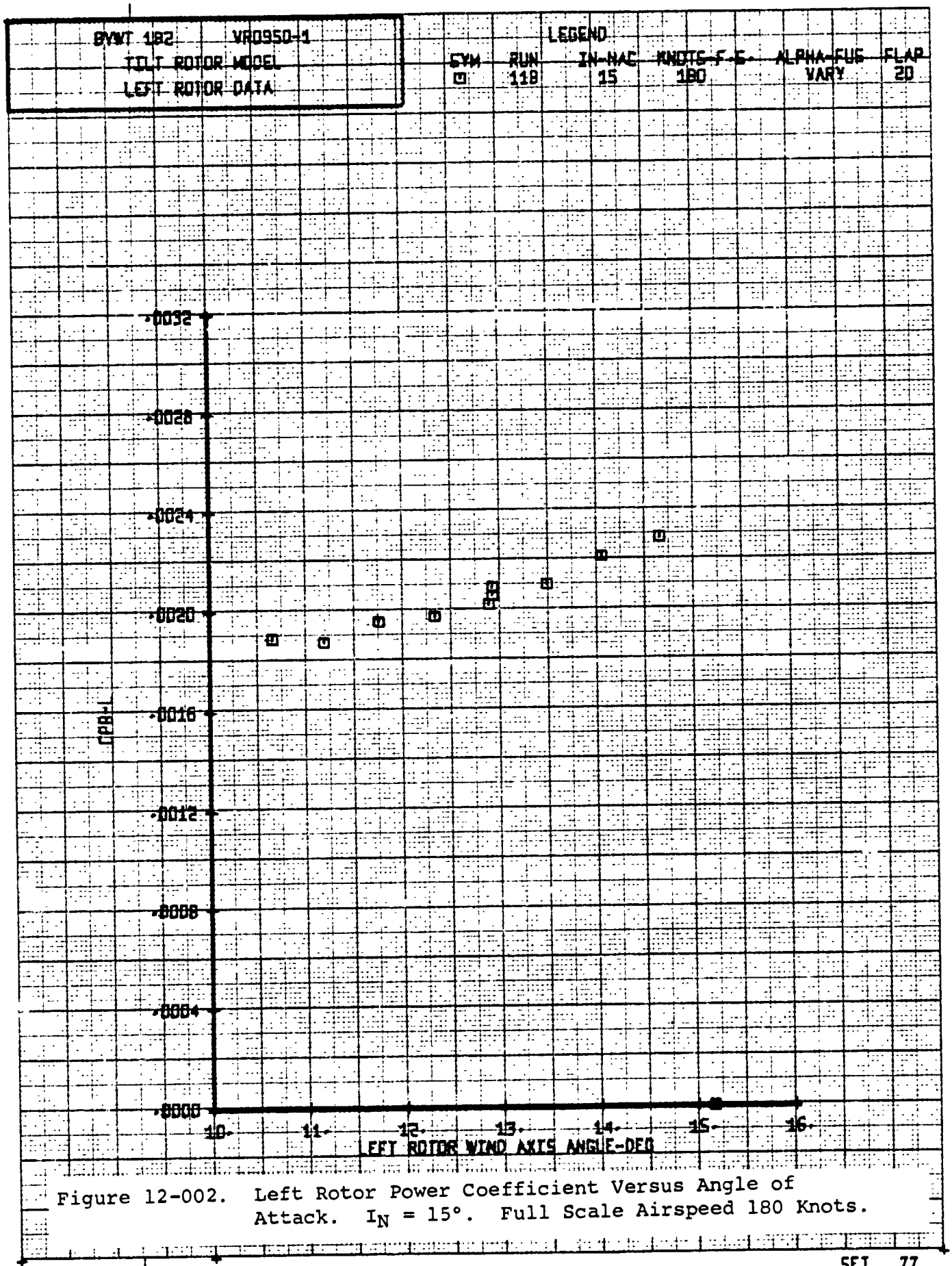


Figure 12-002. Left Rotor Power Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

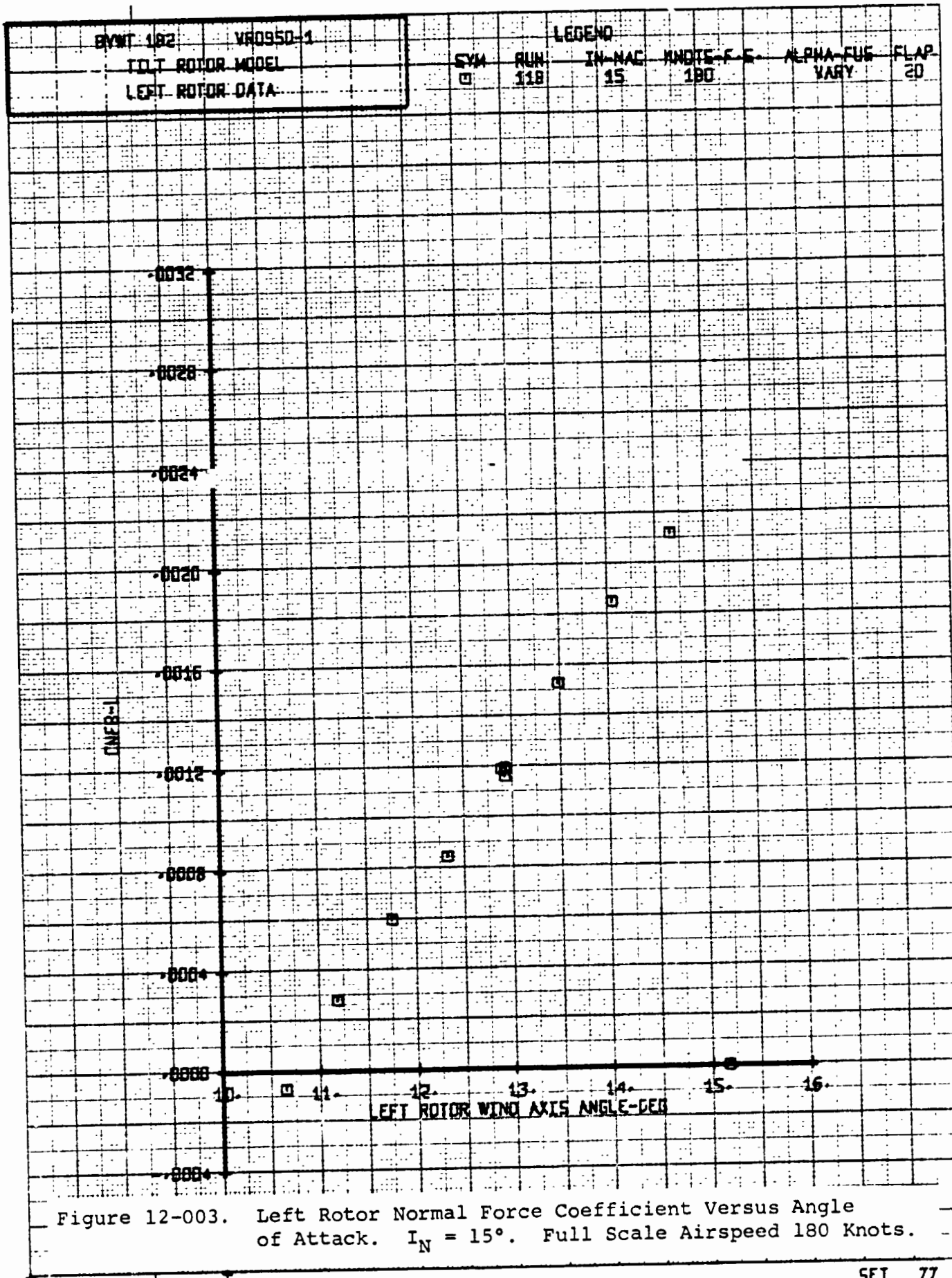


Figure 12-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

SET 77
BVWT 182

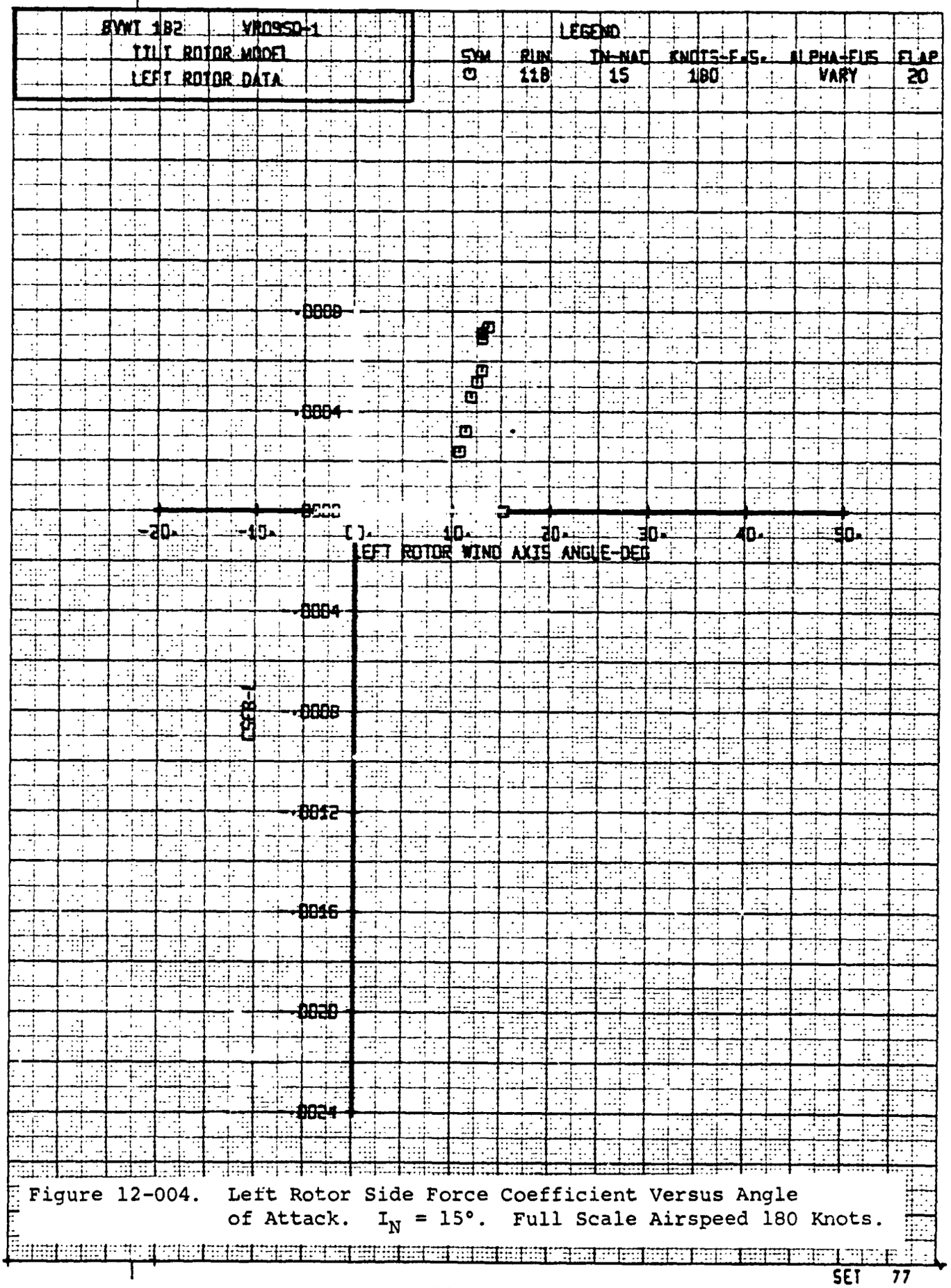


Figure 12-004. Left Rotor Side Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

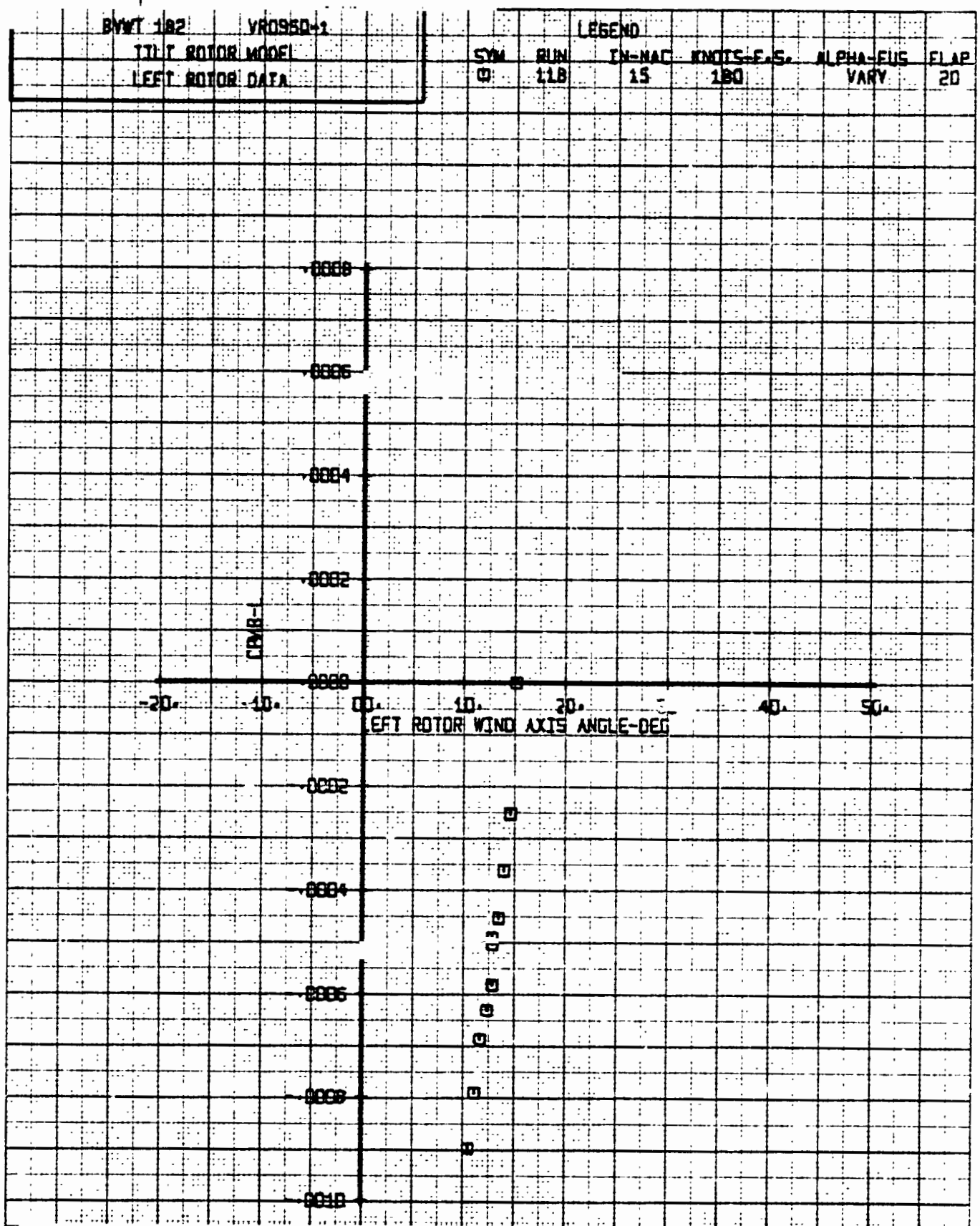


Figure 12-005. Left Rotor Pitching Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

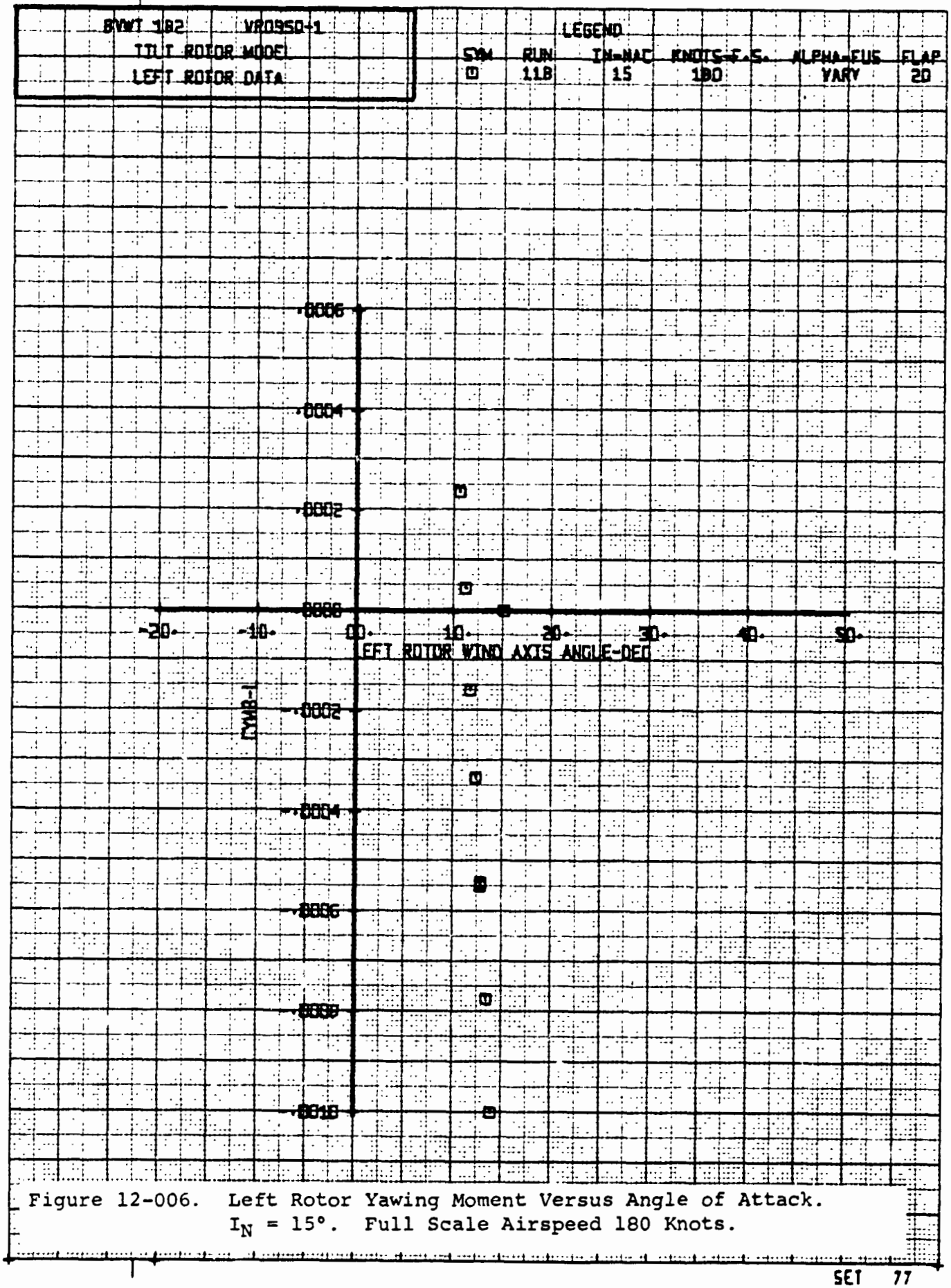


Figure 12-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

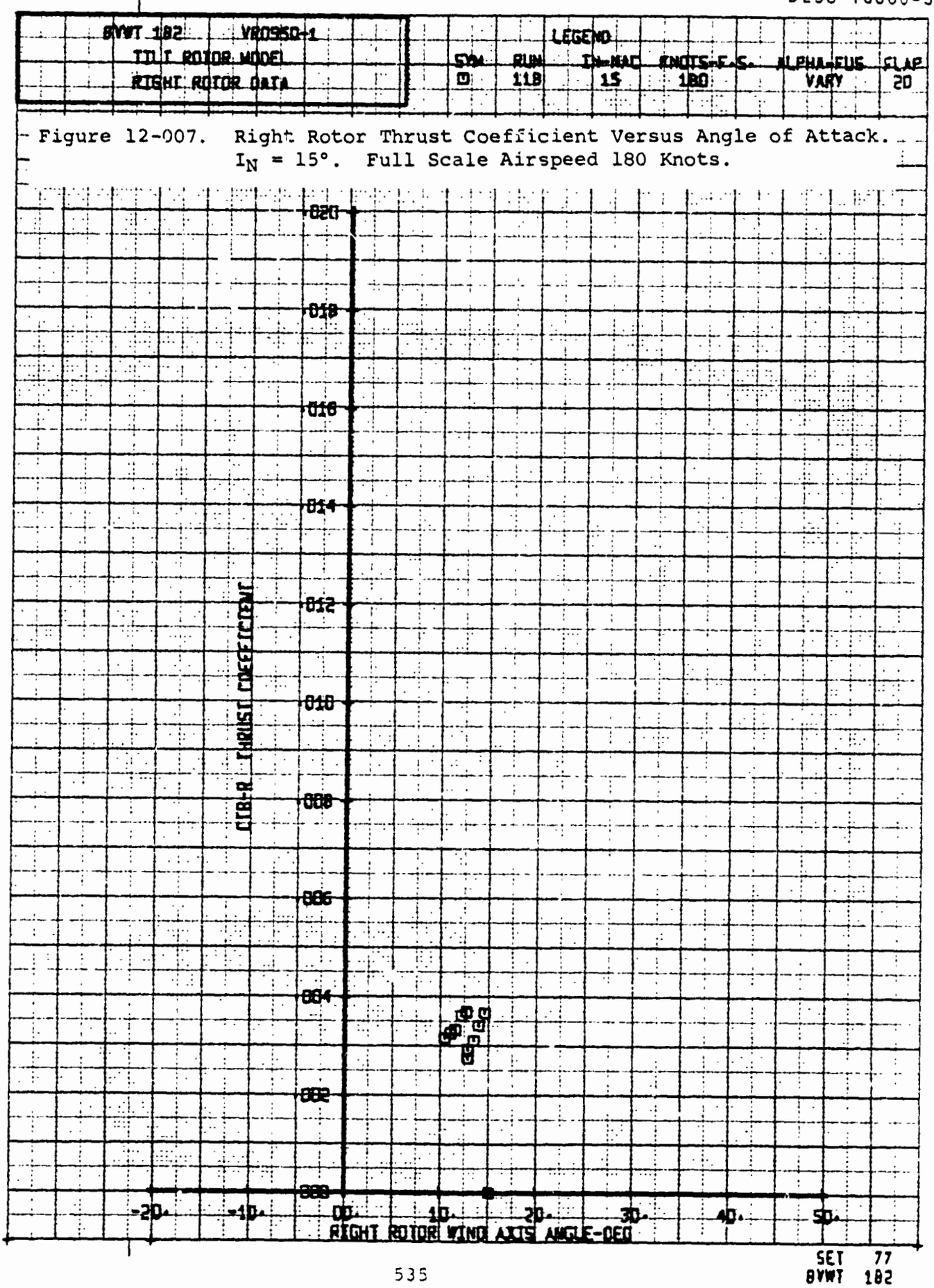


Figure 12-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

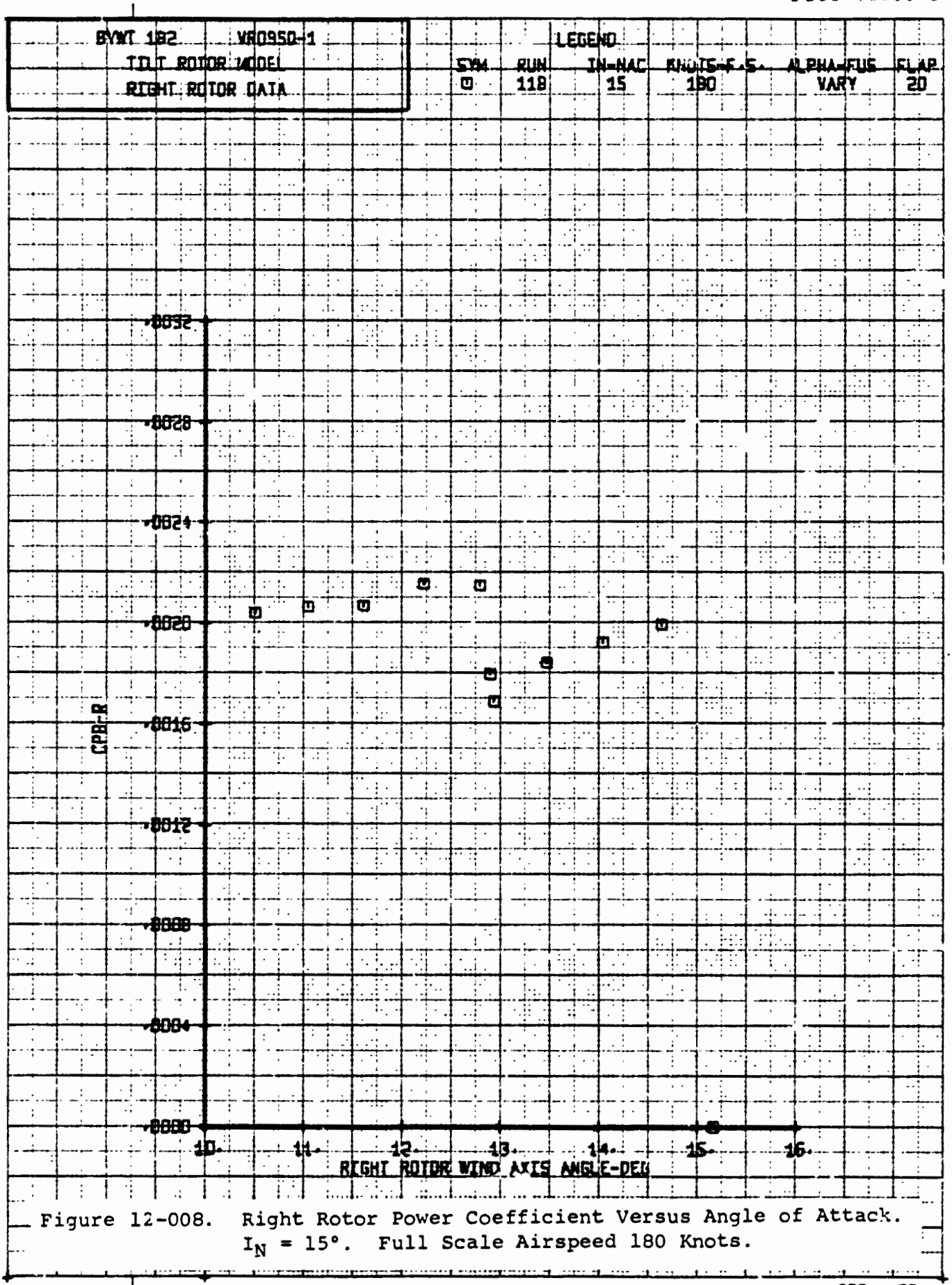


Figure 12-008. Right Rotor Power Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

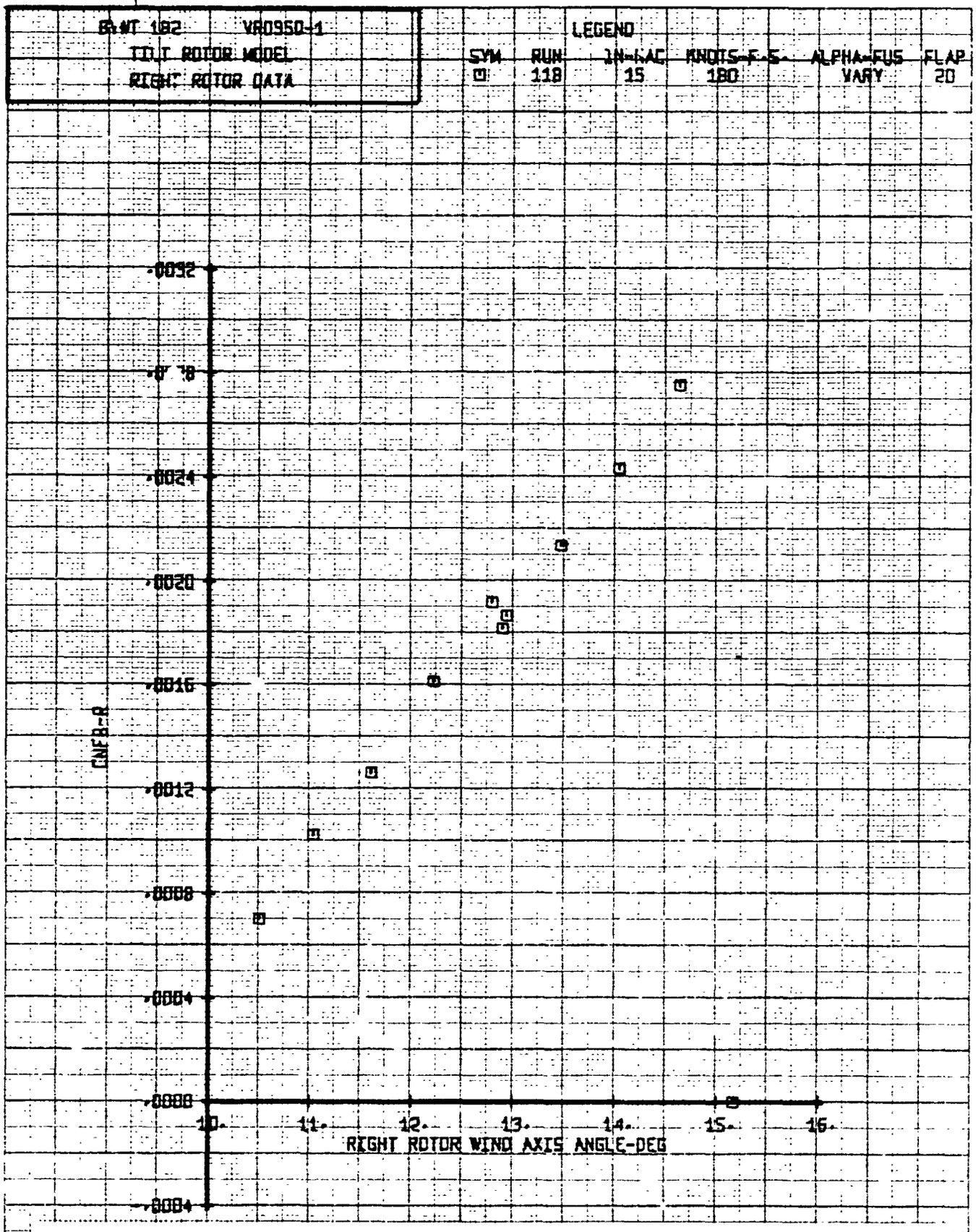


Figure 12-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

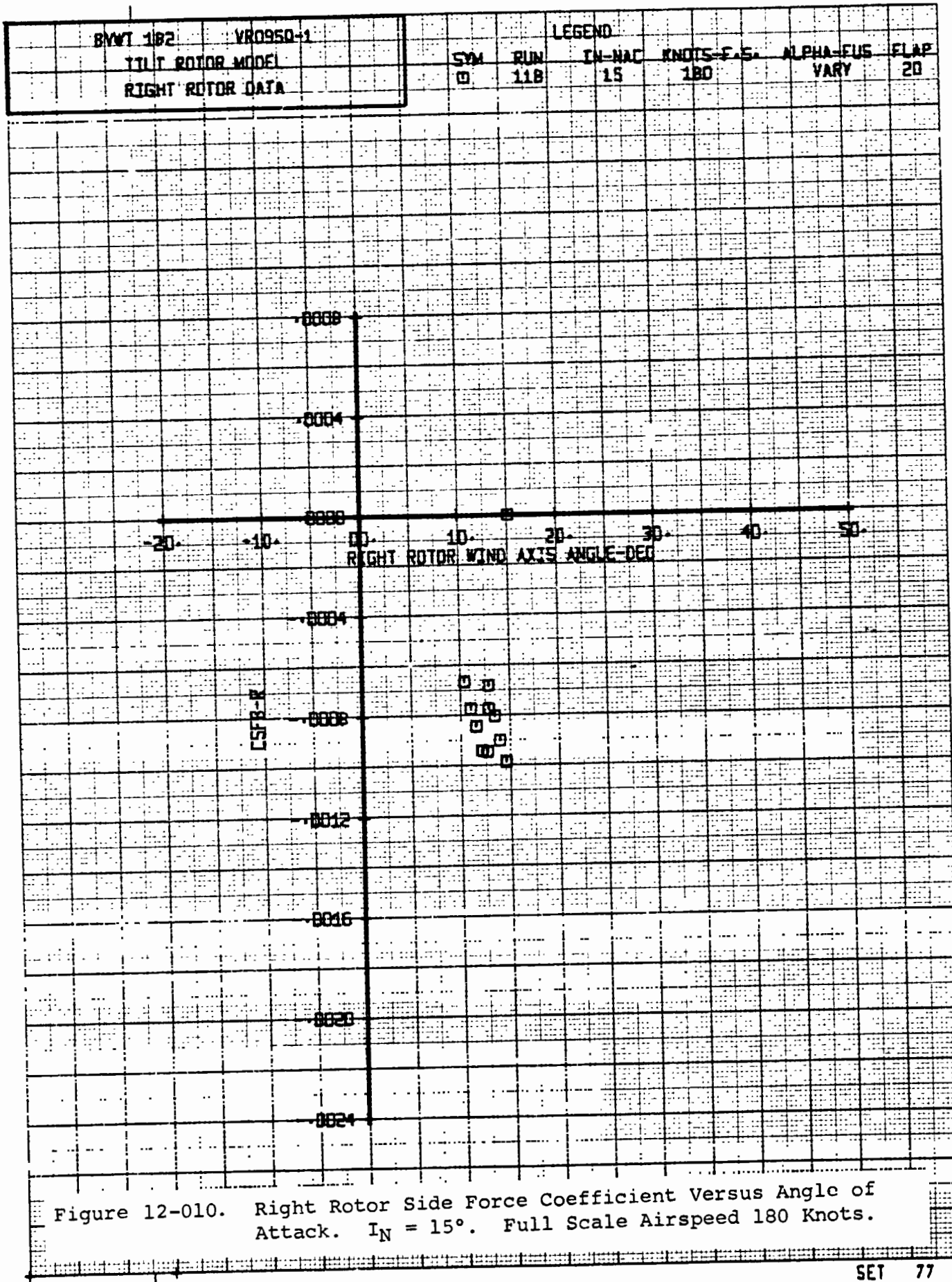


Figure 12-010. Right Rotor Side Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

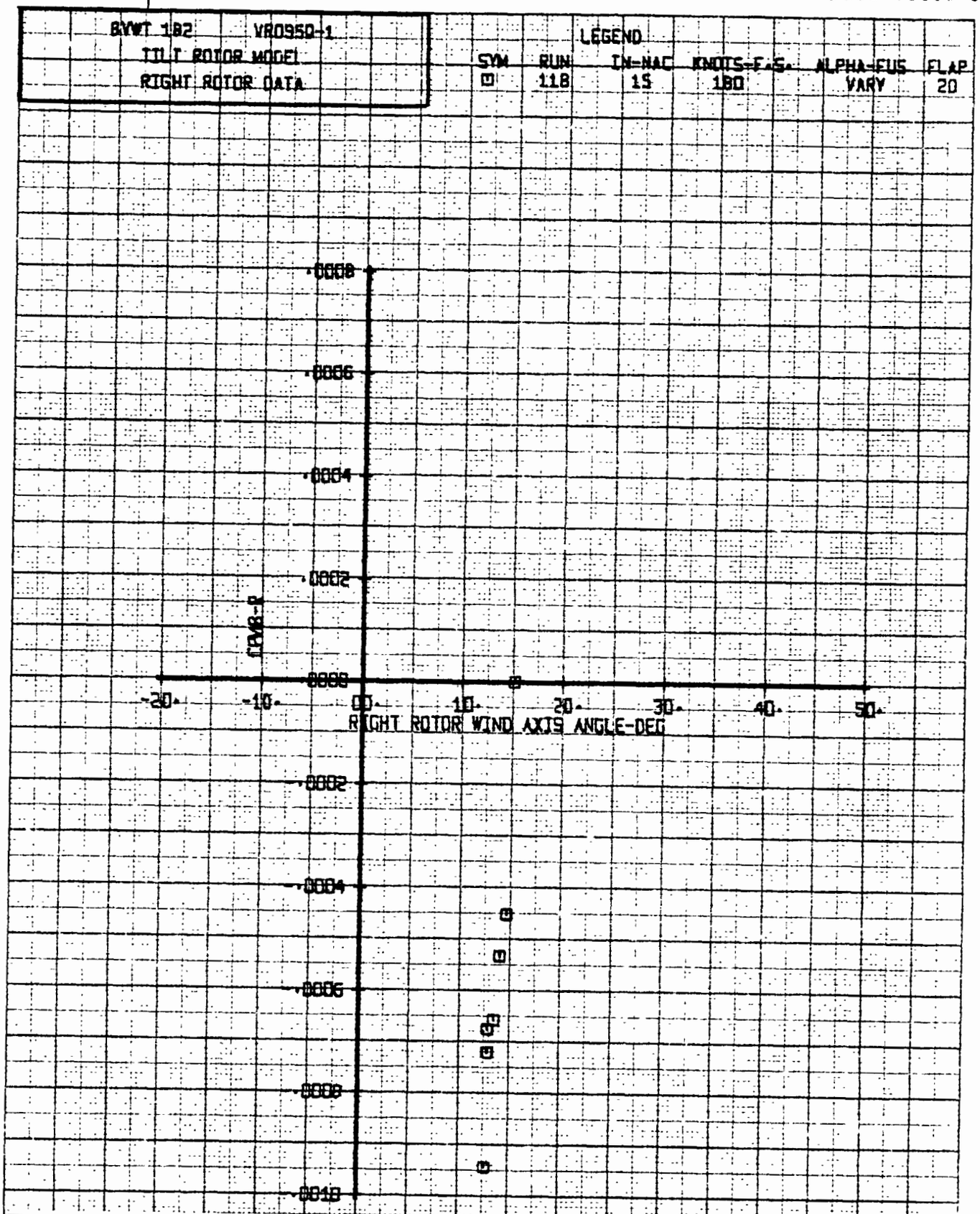


Figure 12-011. Right Rotor Pitching Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

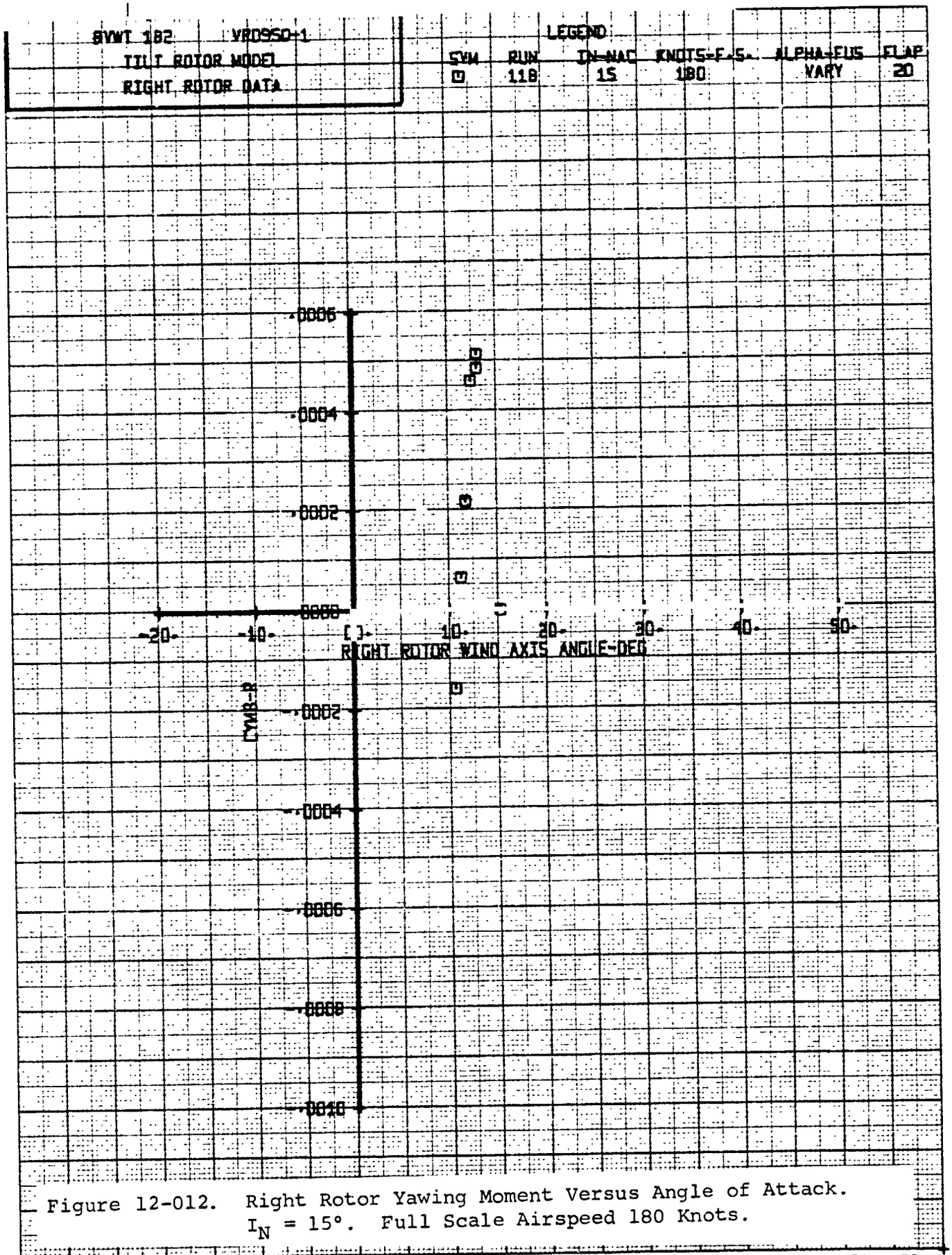
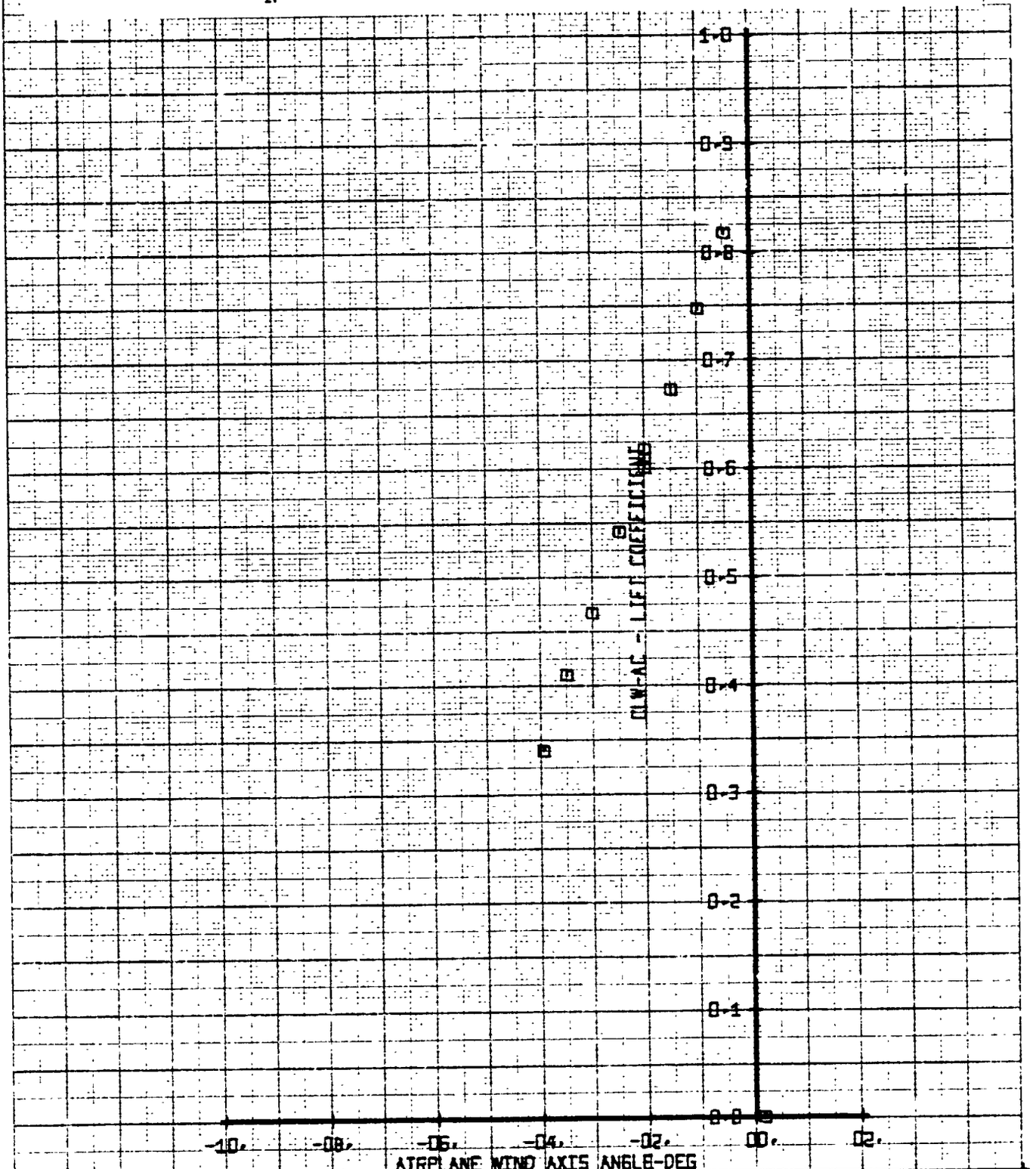


Figure 12-012. Right Rotor Yawing Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VA0950-1
TILT ROTOR MODEL

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	118	15	180	VARY	20

Figure 12-013. Aircraft Lift Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.



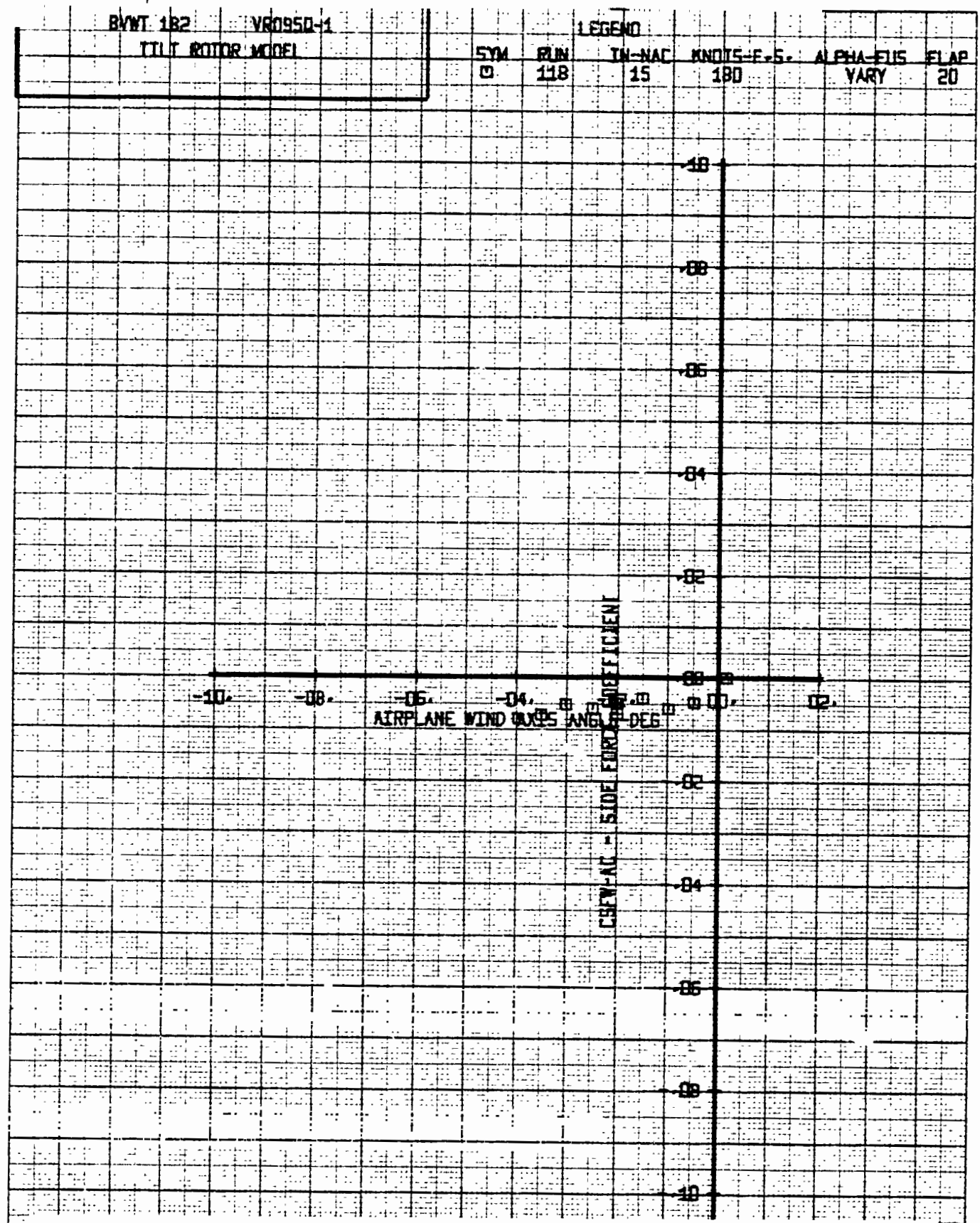


Figure 12-014. Aircraft Side Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

77
182

SET 77
BVWT 182

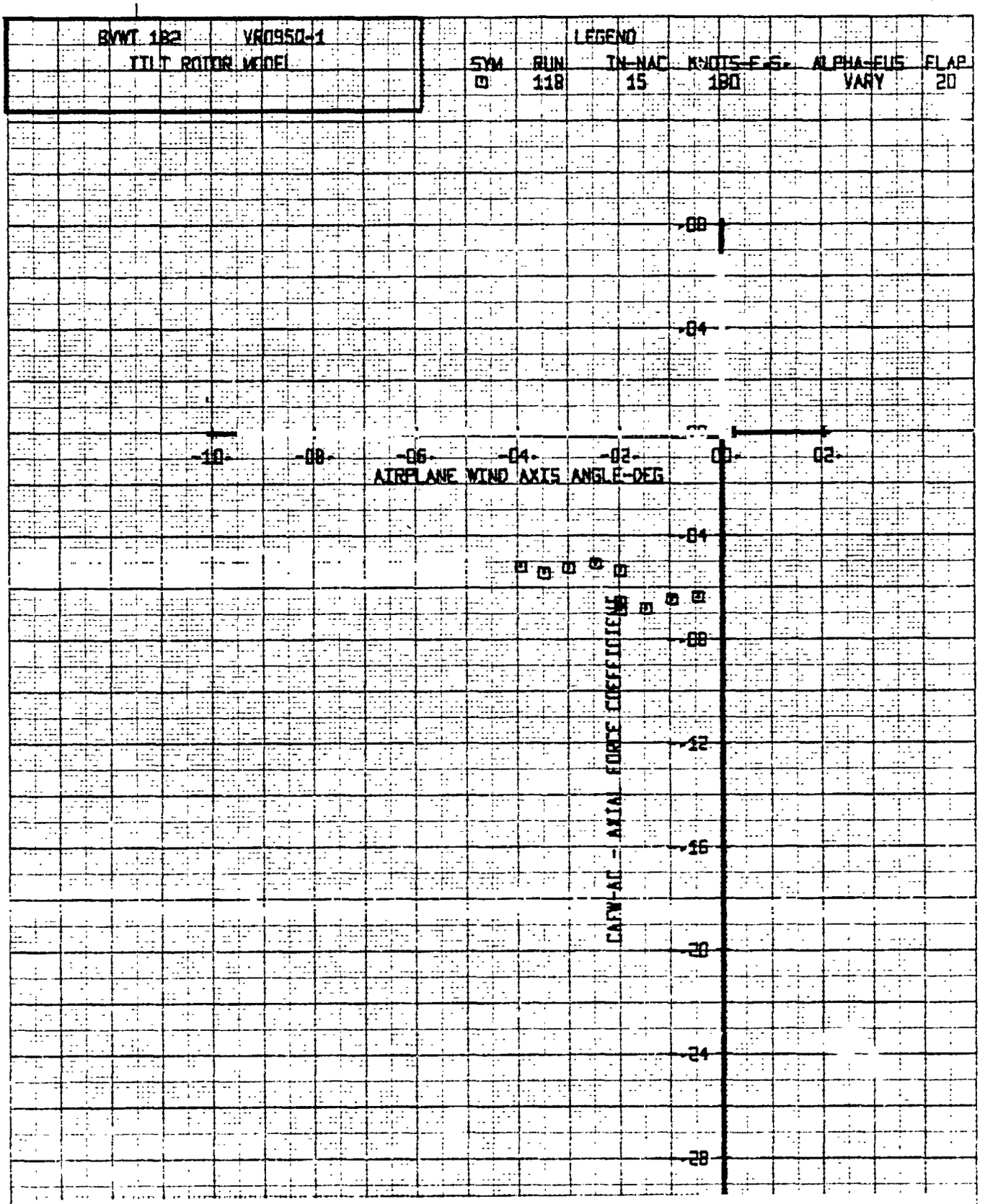


Figure 12-015. Aircraft Axial Force Coefficient Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

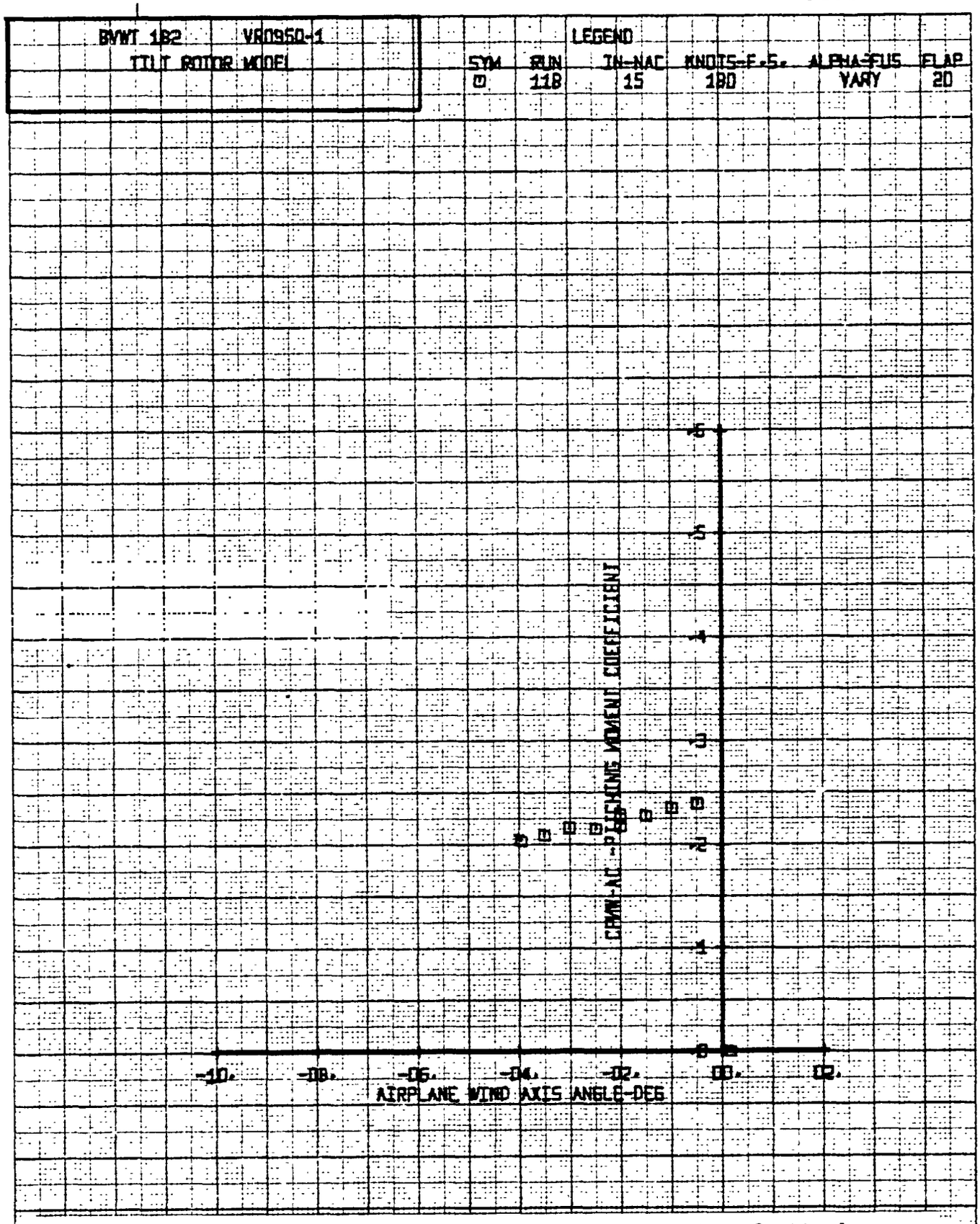


Figure 12-016. Aircraft Pitching Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

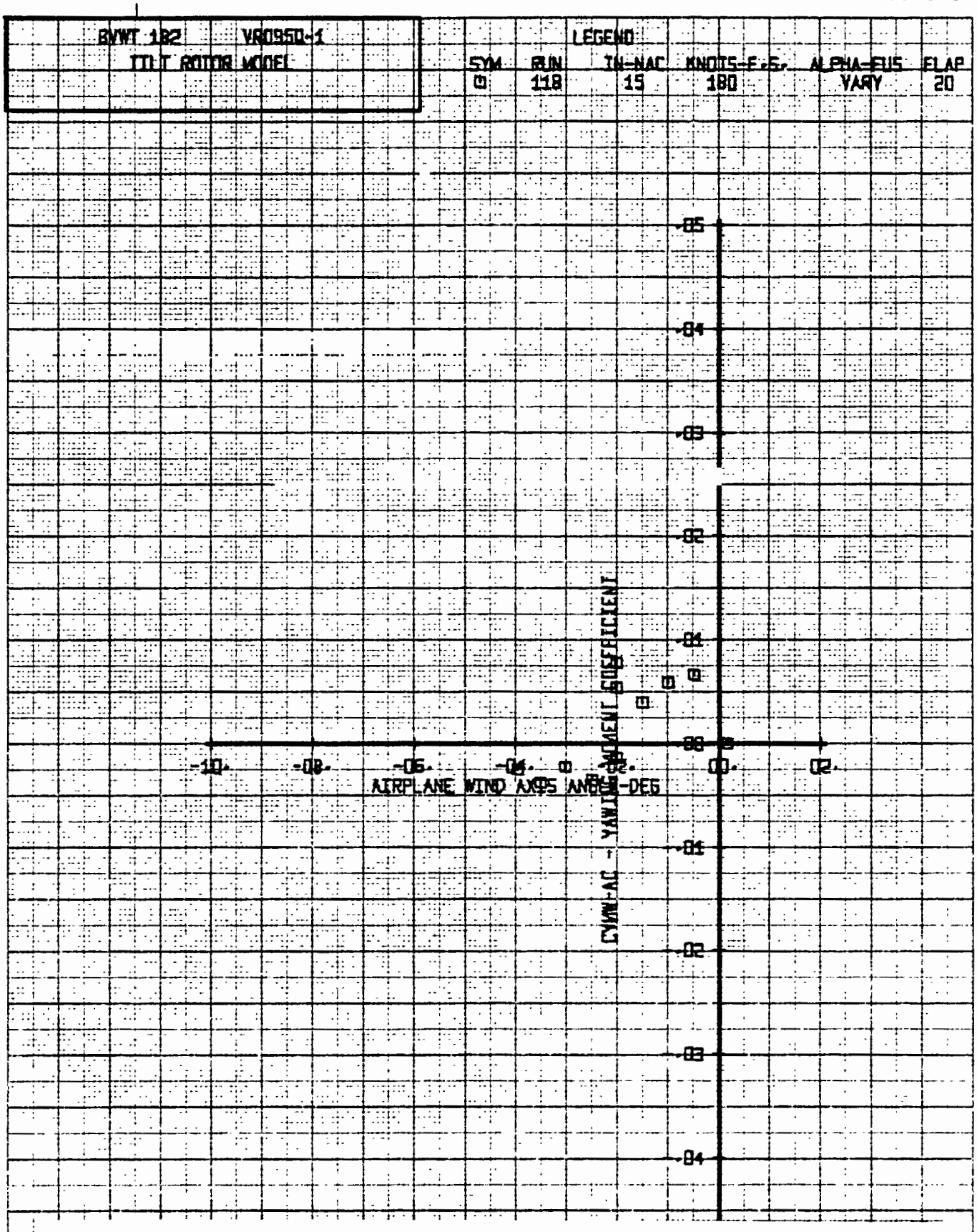


Figure 12-017. Aircraft Yawing Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

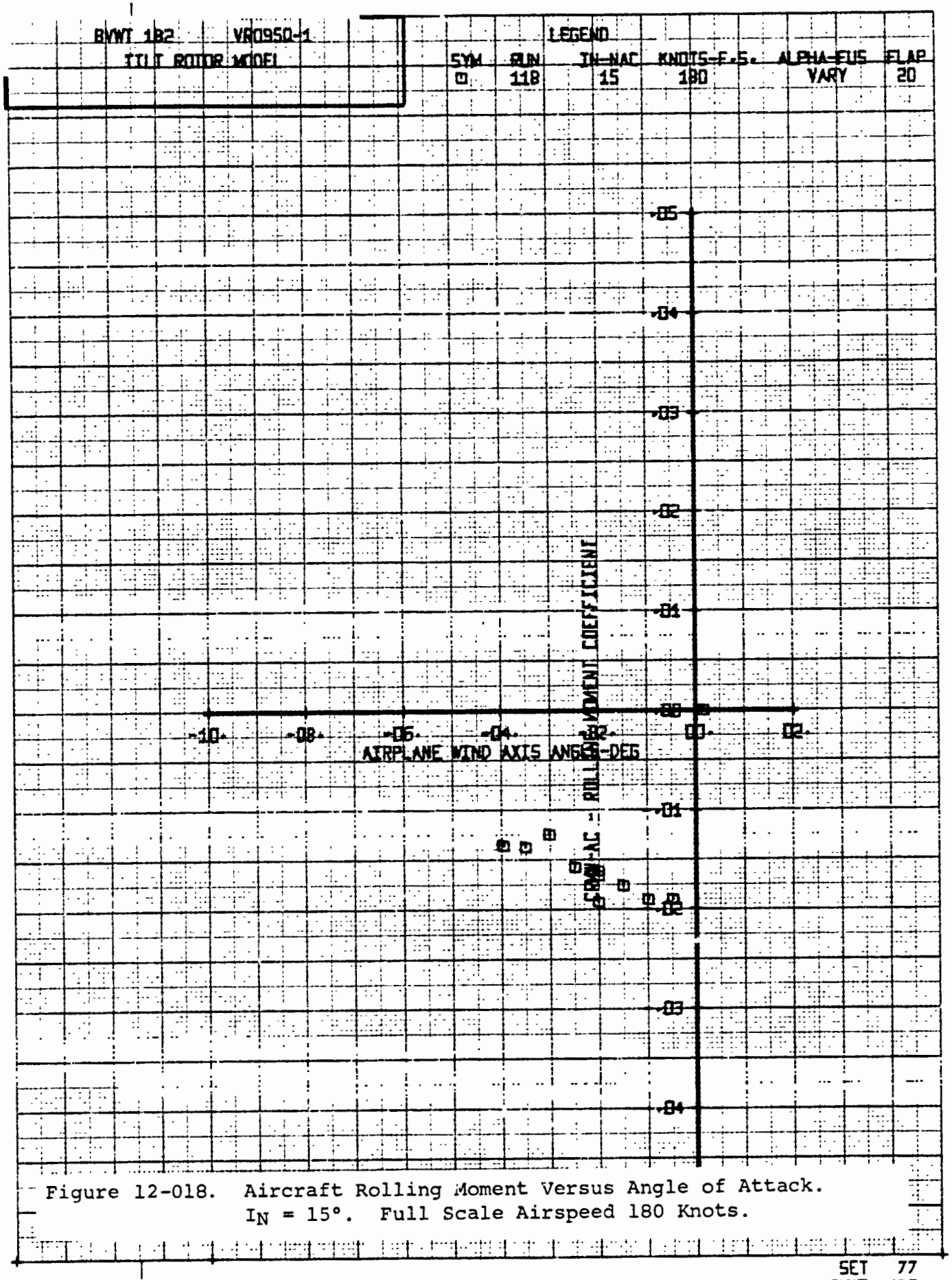


Figure 12-018. Aircraft Rolling Moment Versus Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

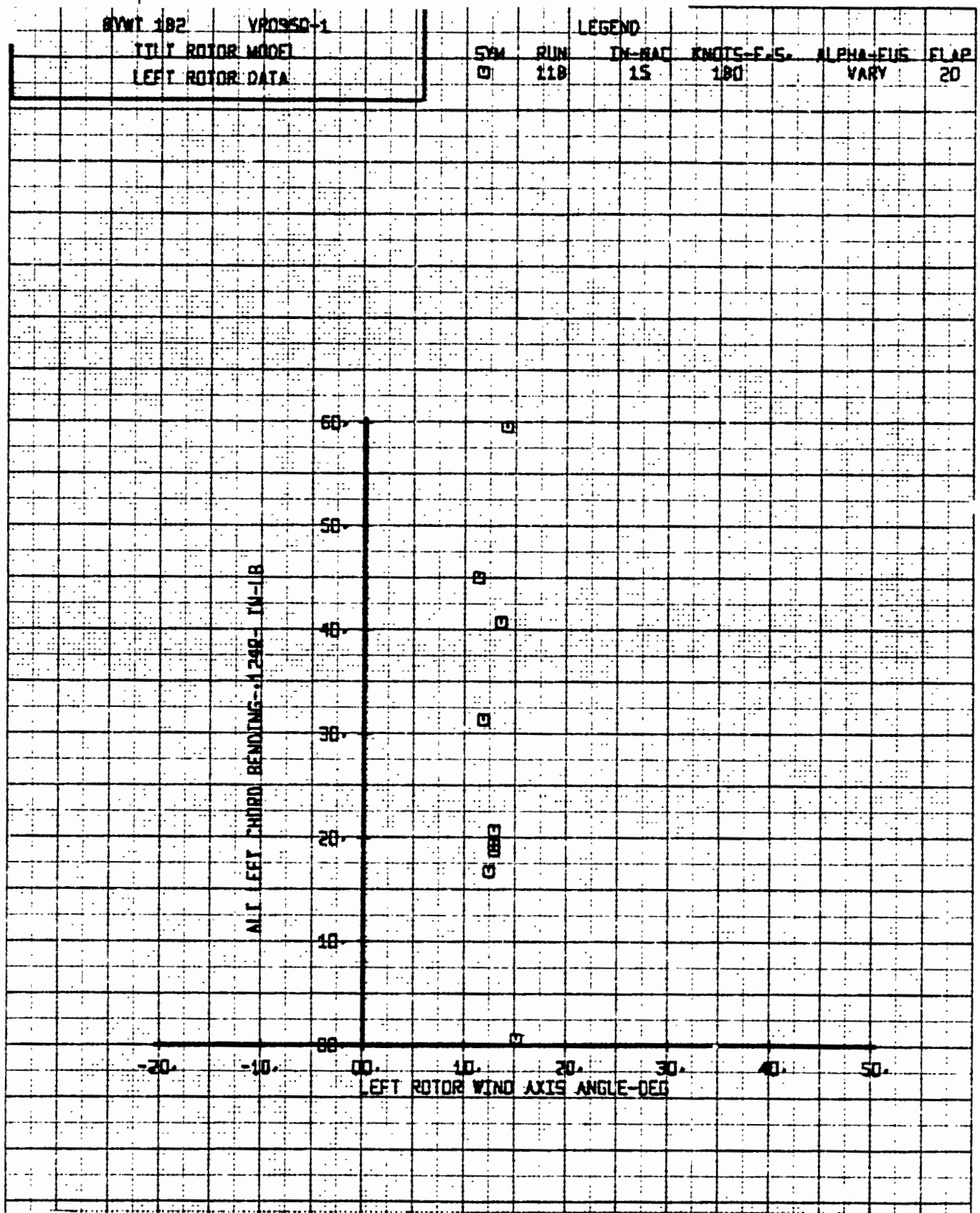


Figure 12-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

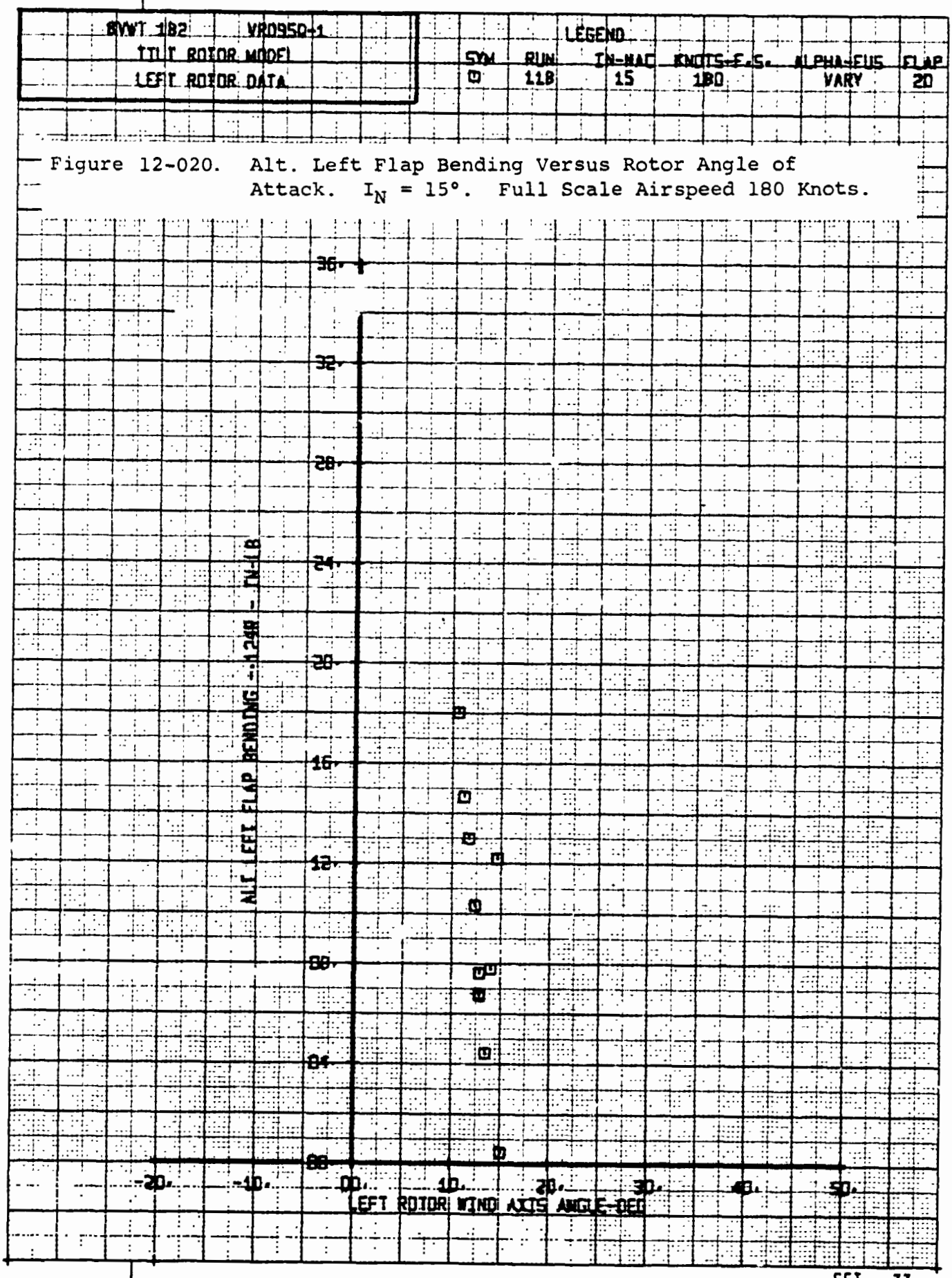


Figure 12-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

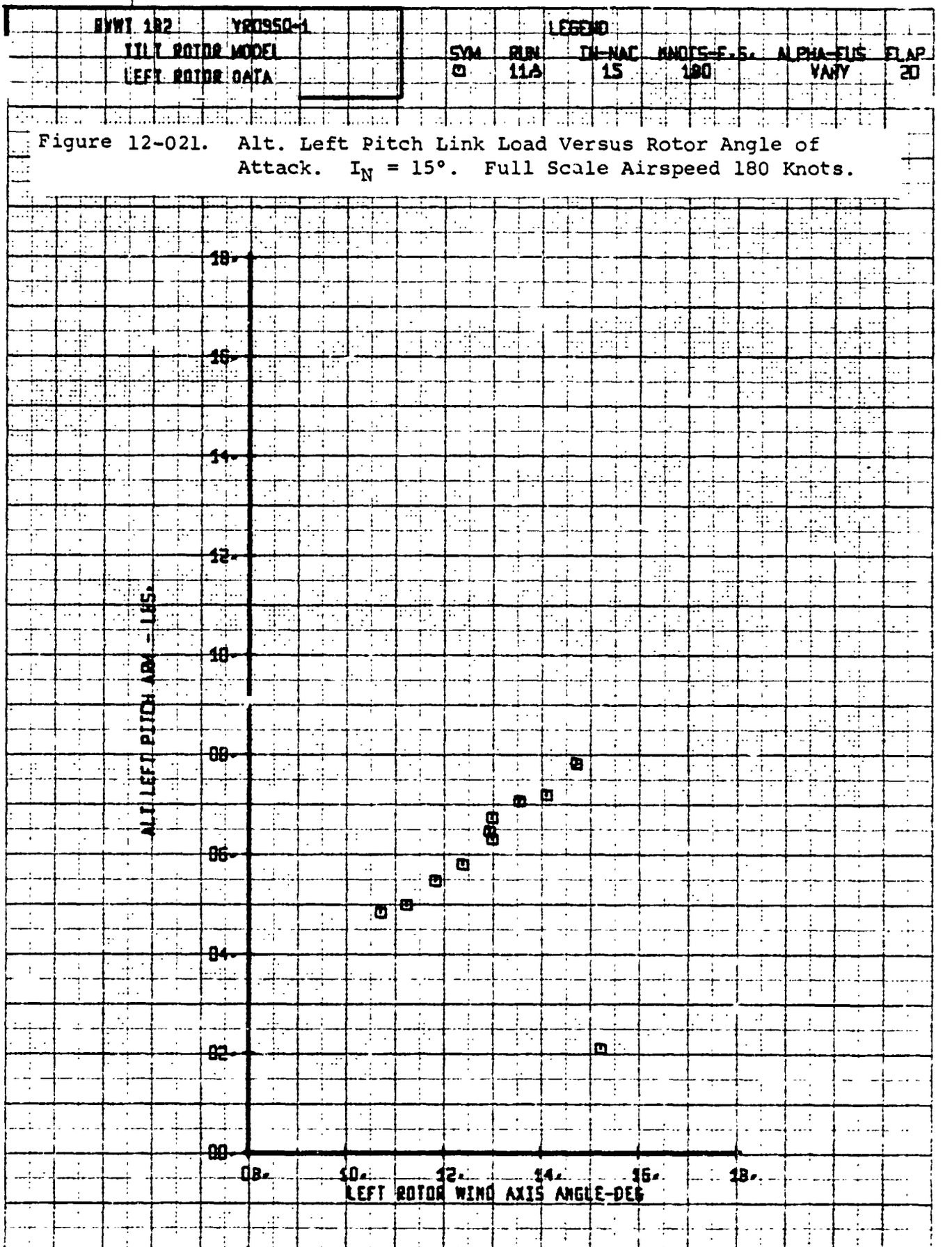


Figure 12-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

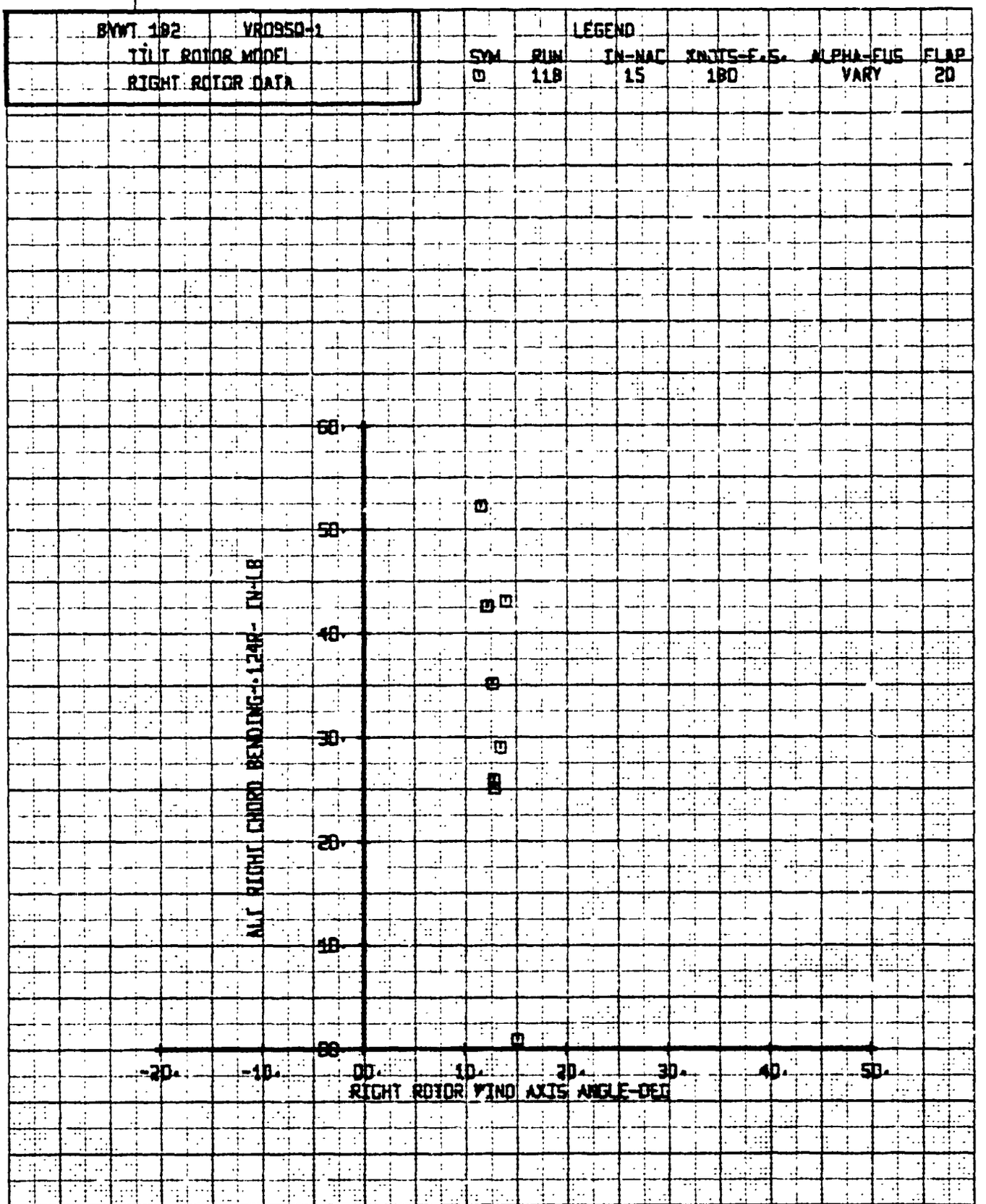


Figure 12-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

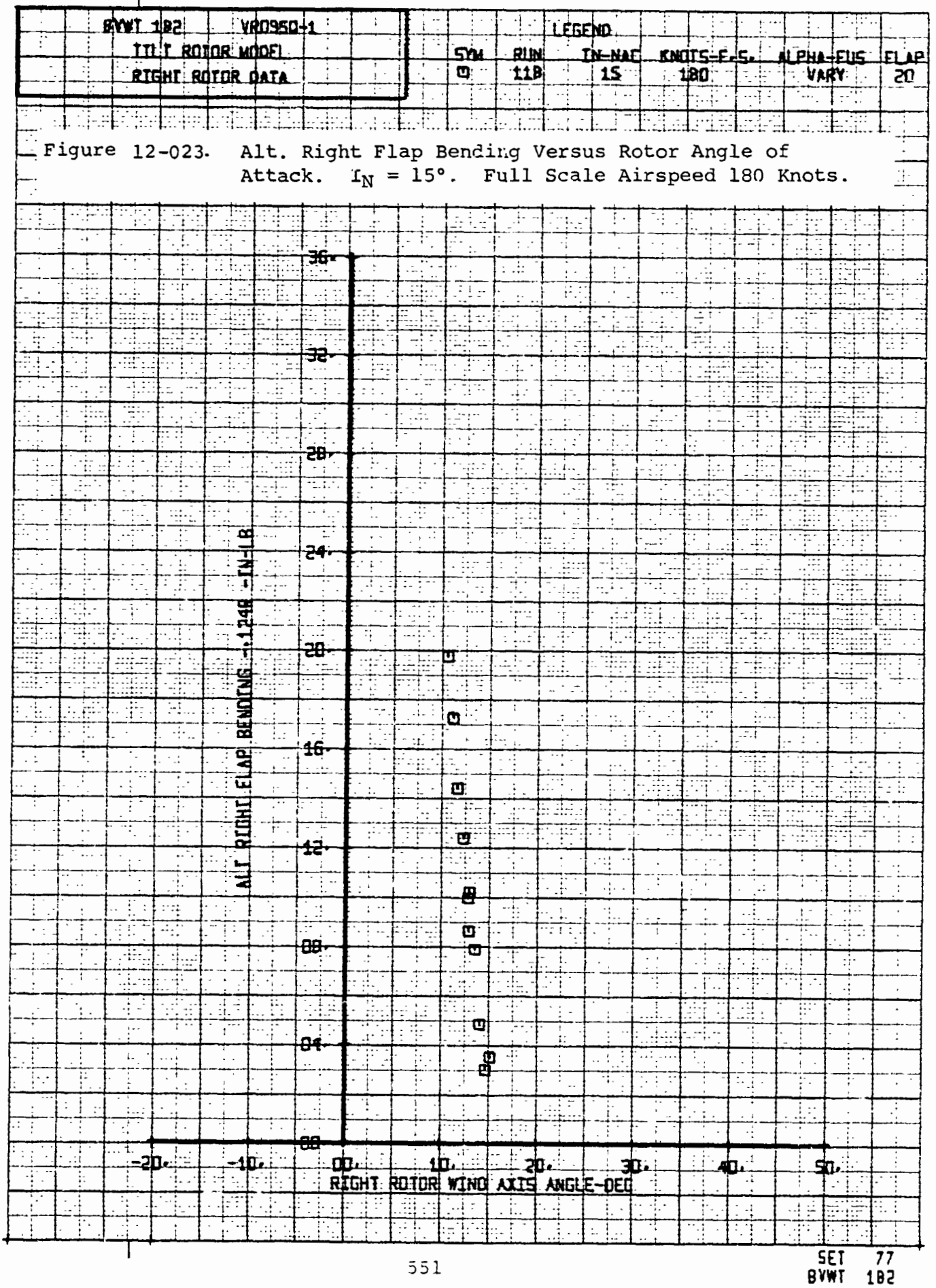


Figure 12-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. i_N = 15°. Full Scale Airspeed 180 Knots.

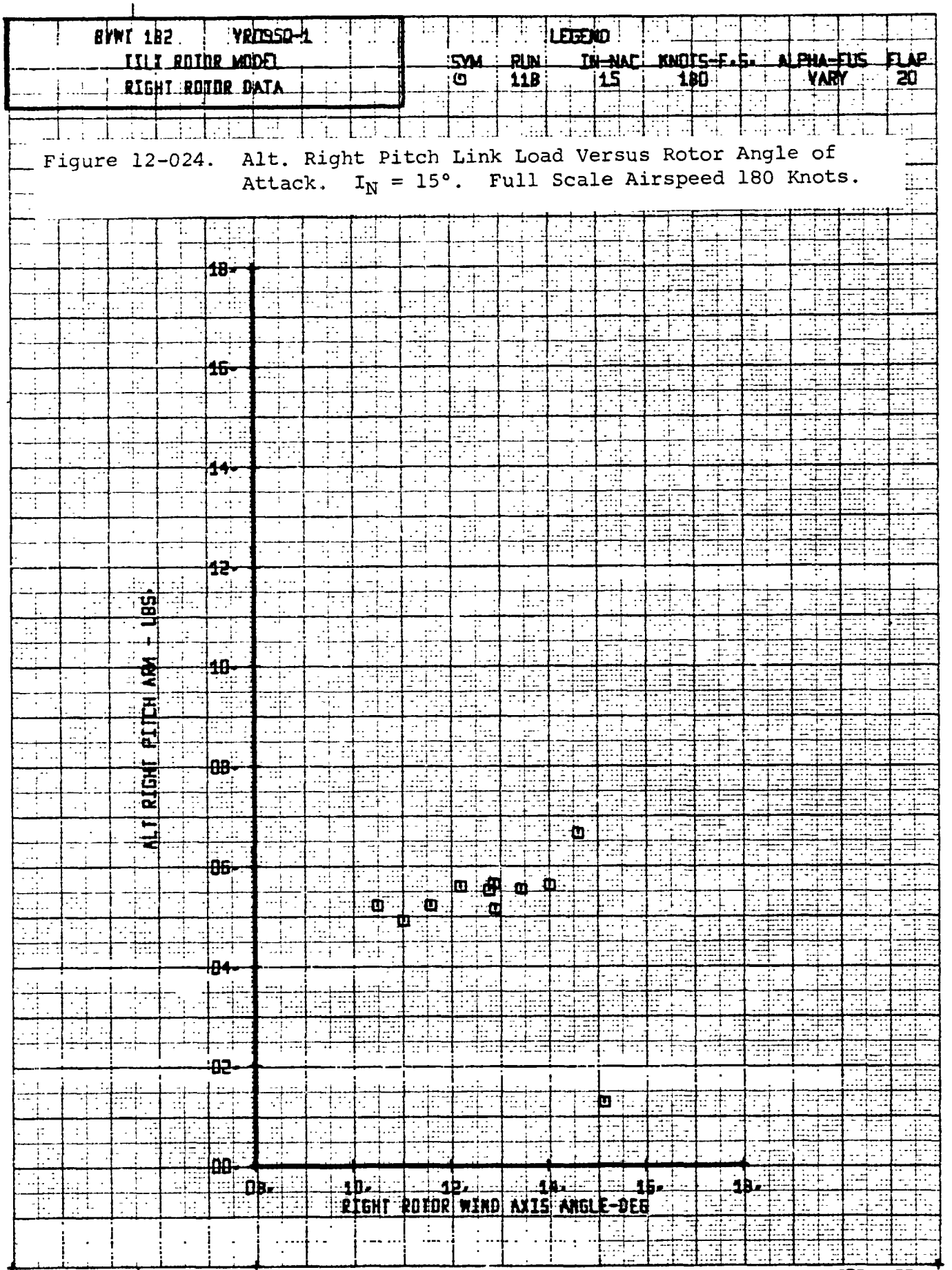


Figure 12-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. I_N = 15°. Full Scale Airspeed 180 Knots.

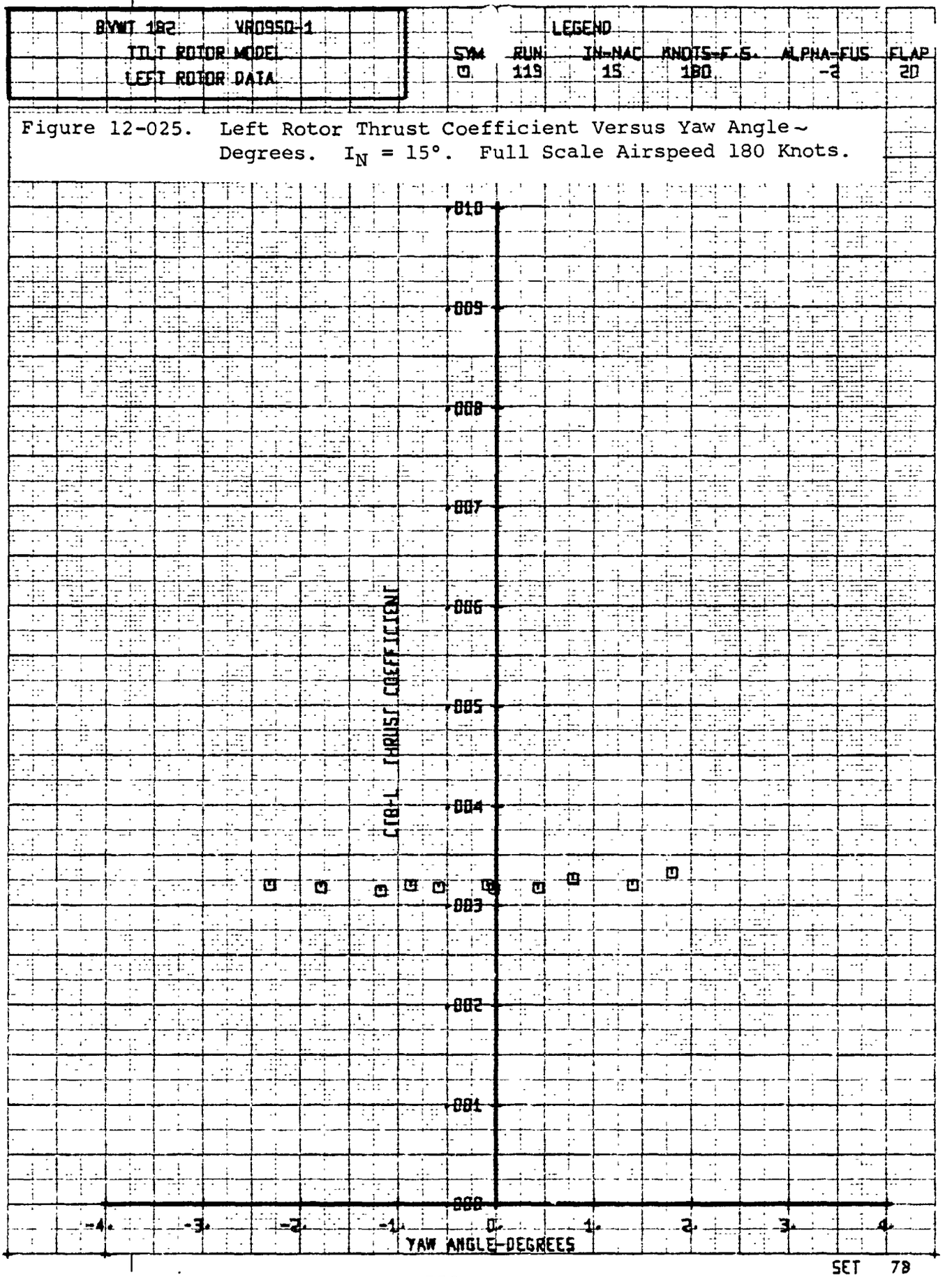


Figure 12-025. Left Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

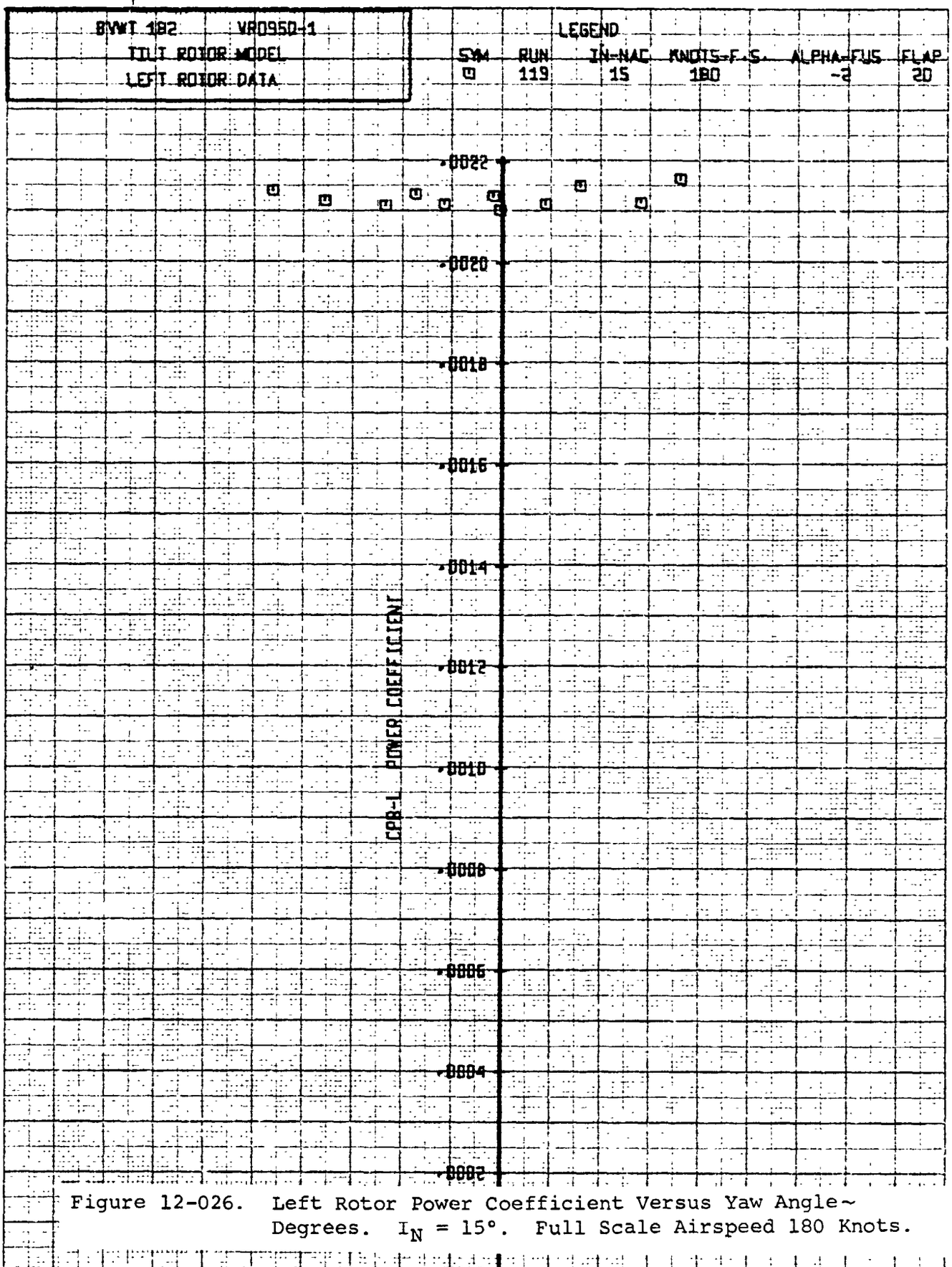


Figure 12-026. Left Rotor Power Coefficient Versus Yaw Angle~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

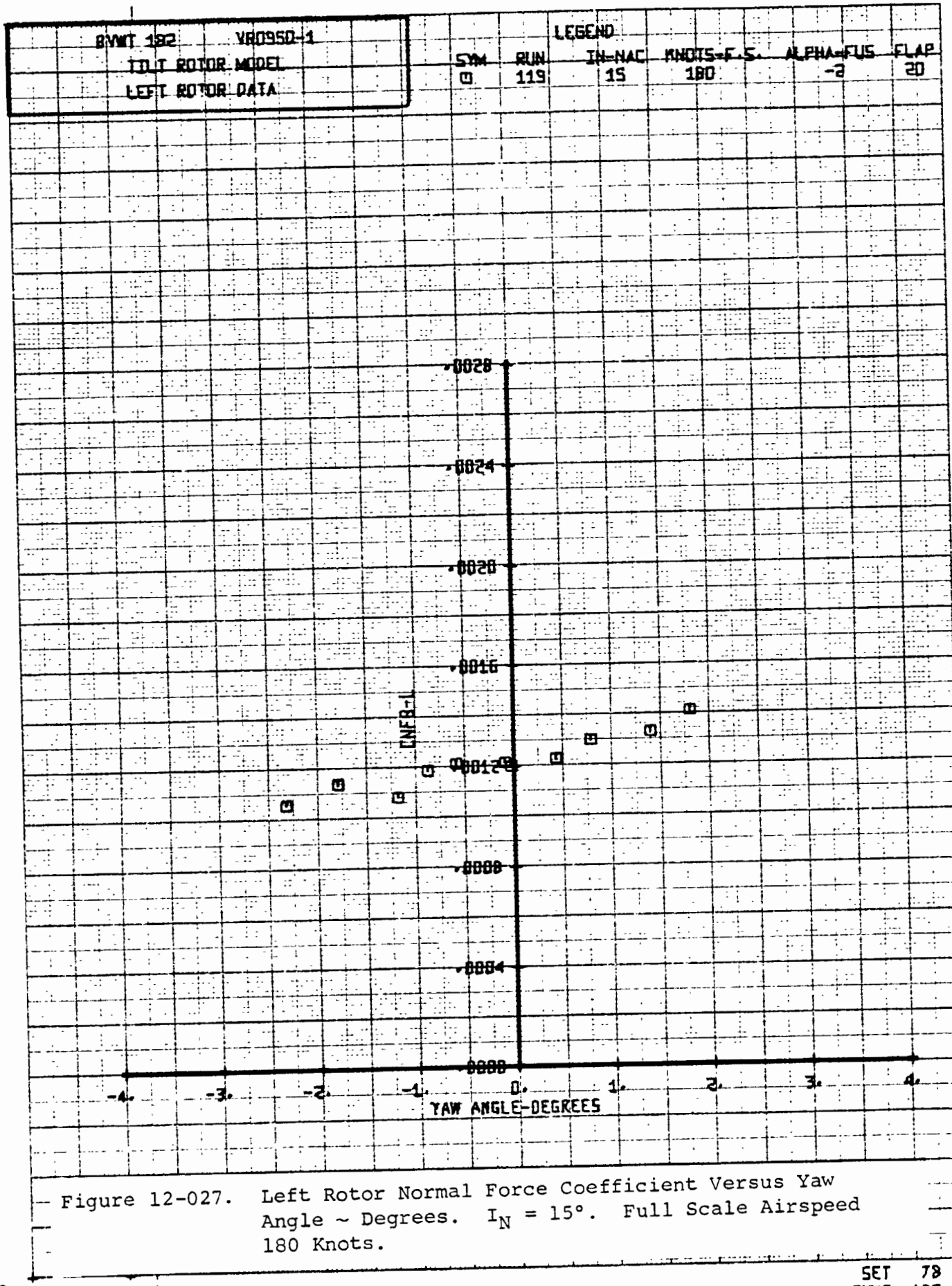


Figure 12-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

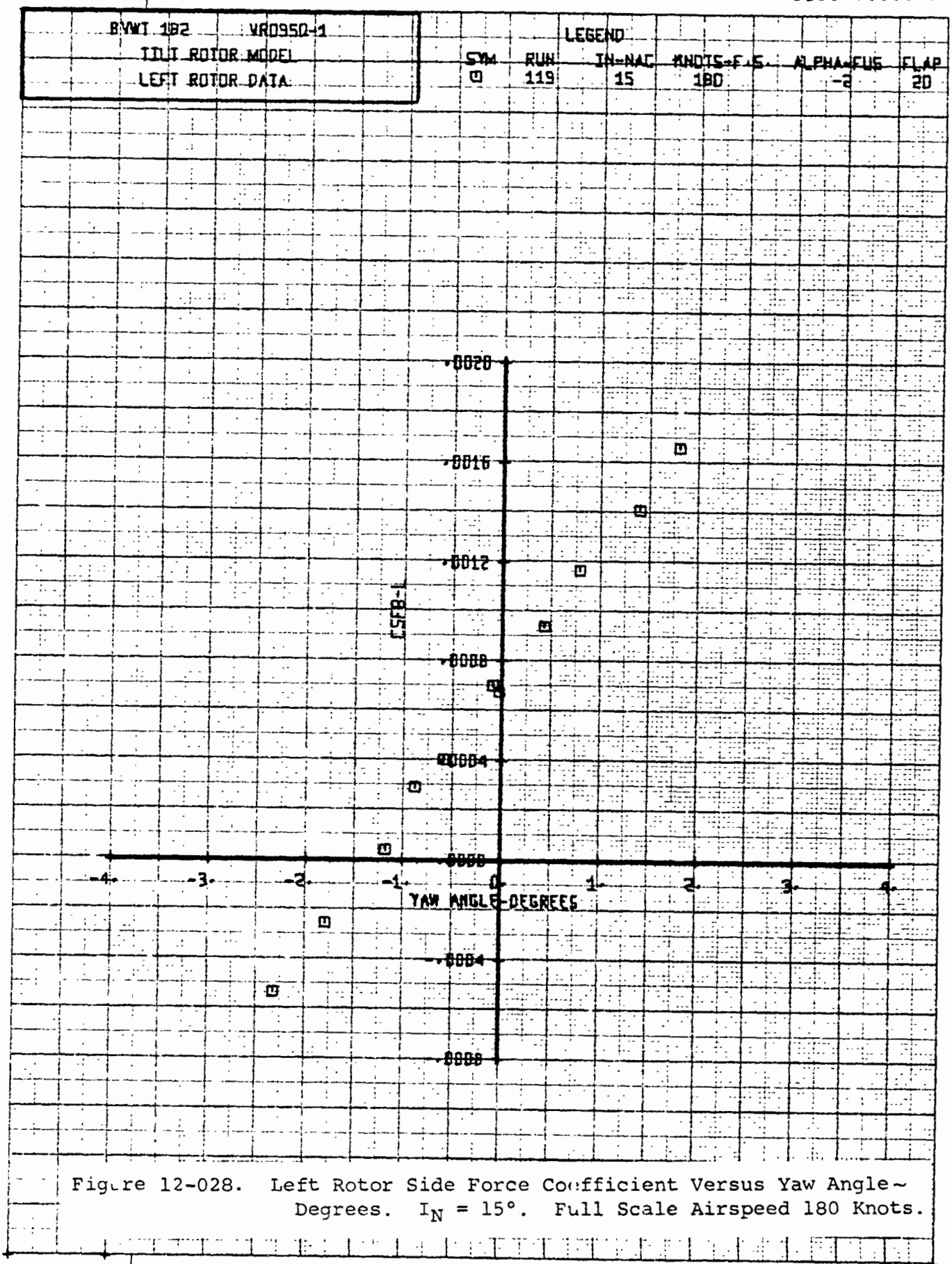


Figure 12-028. Left Rotor Side Force Coefficient Versus Yaw Angle~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

78
182

SET 78
BVWT 182

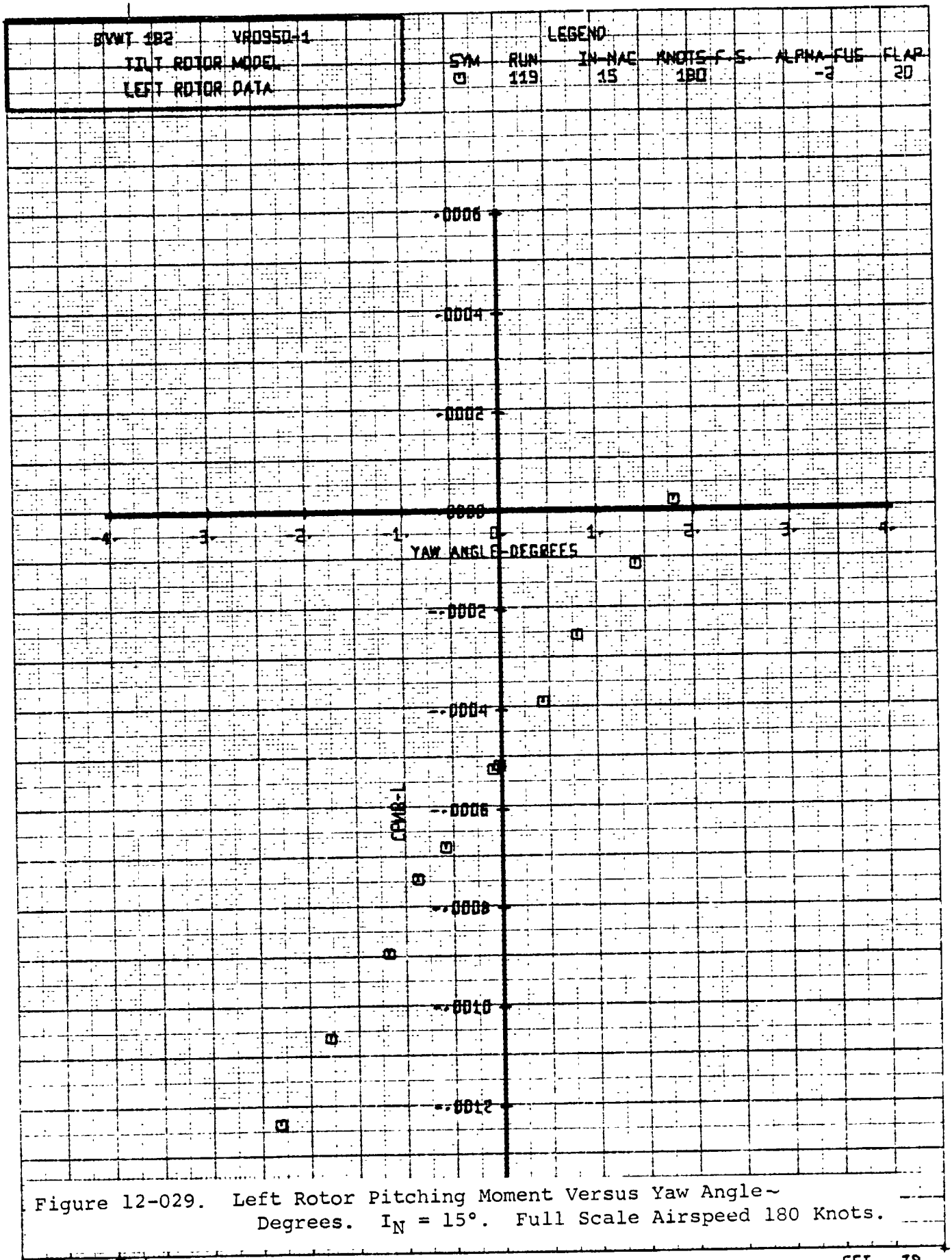


Figure 12-029. Left Rotor Pitching Moment Versus Yaw Angle~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

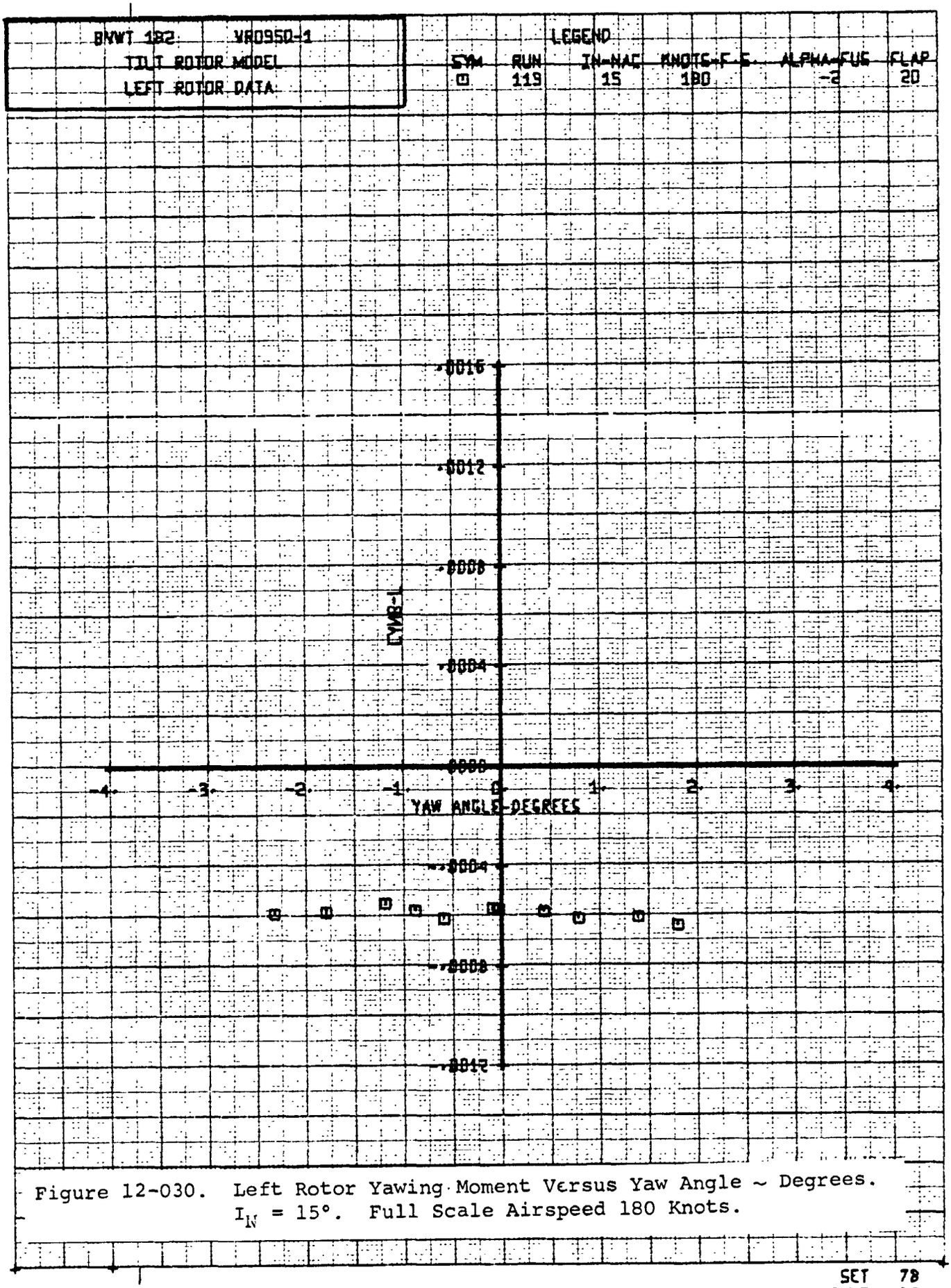
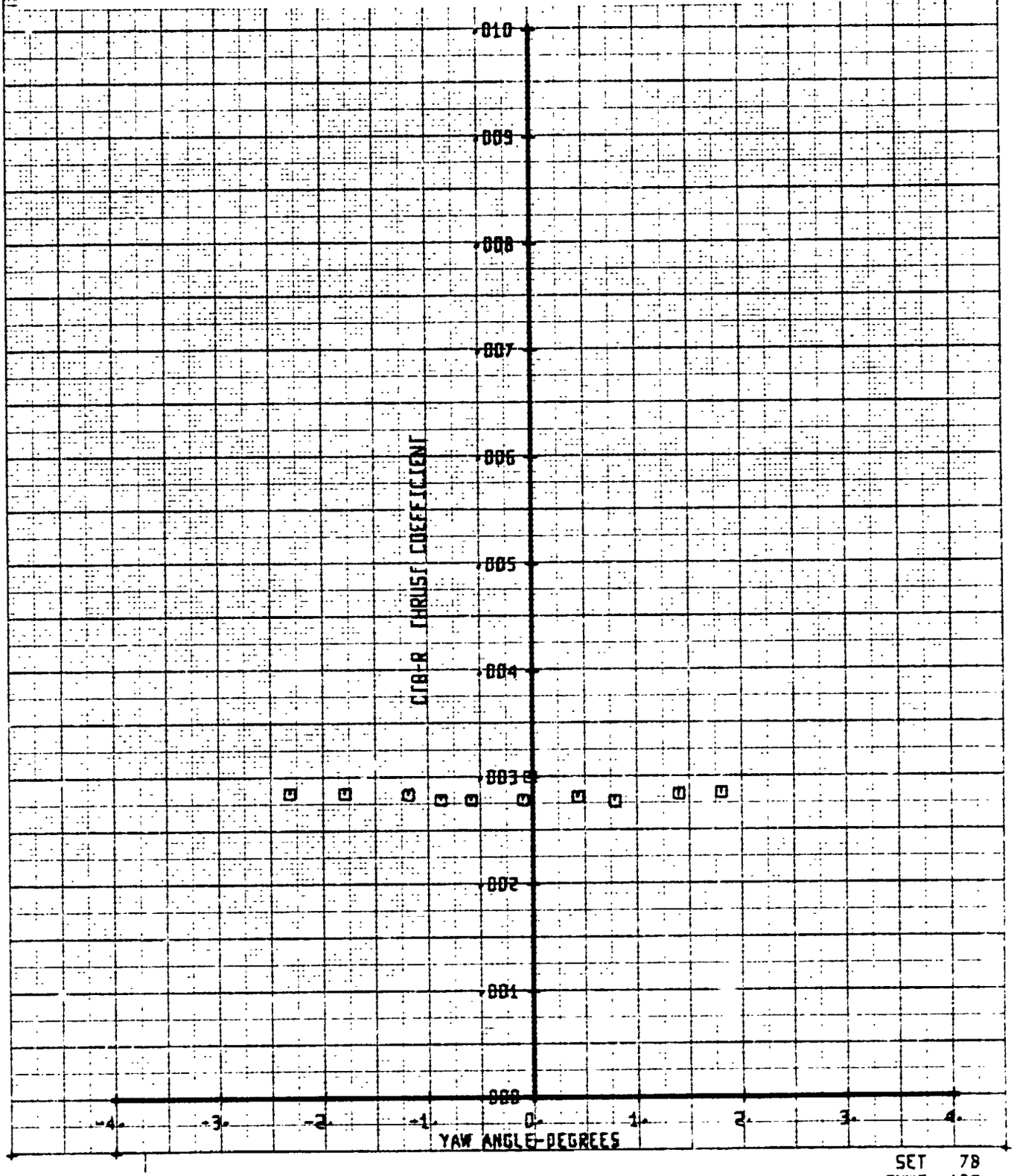


Figure 12-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	119	15	180	-2	20

Figure 12-031. Right Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



ET 78
W 182

SET 78
BVWT 182

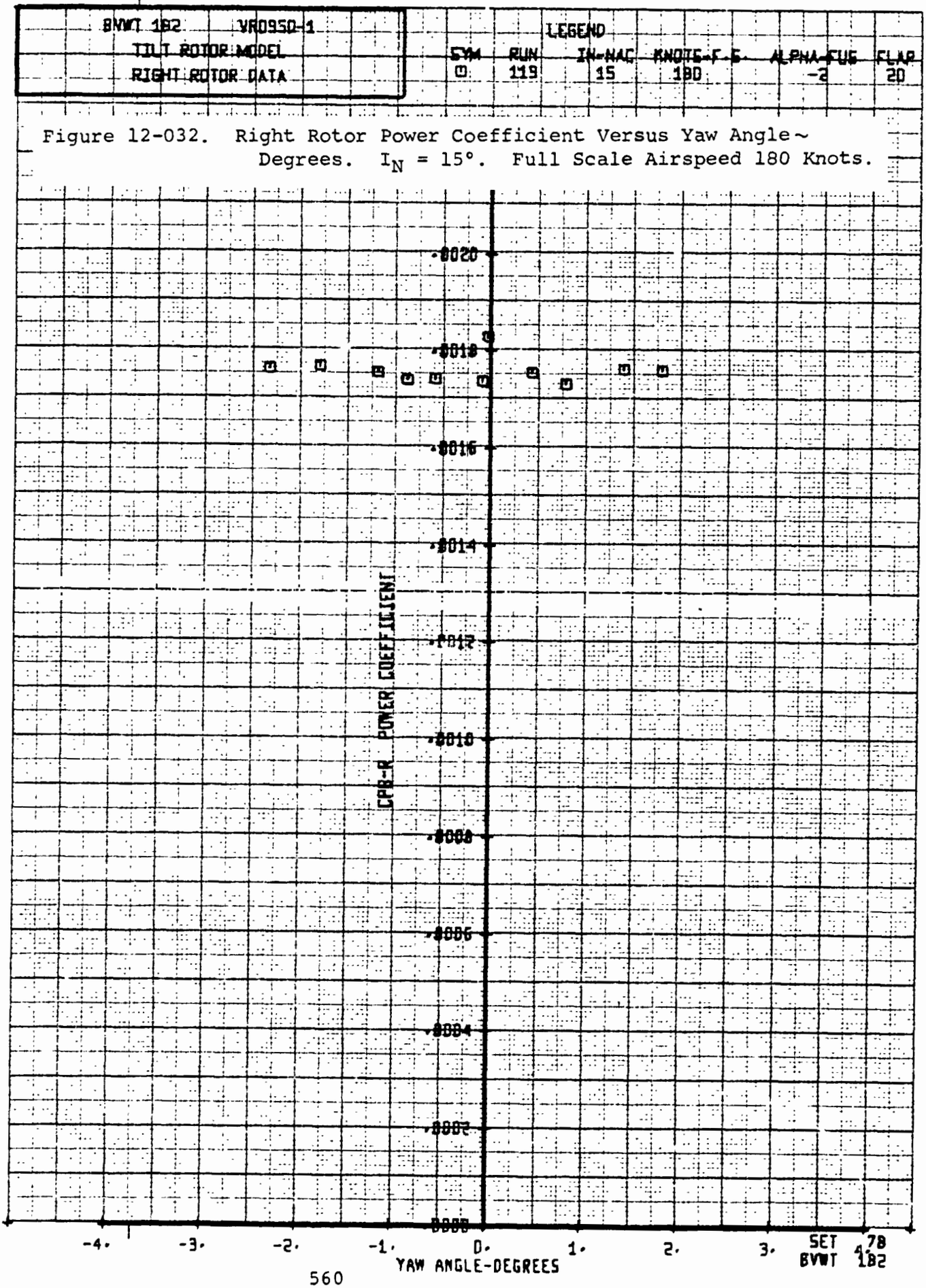


Figure 12-032. Right Rotor Power Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

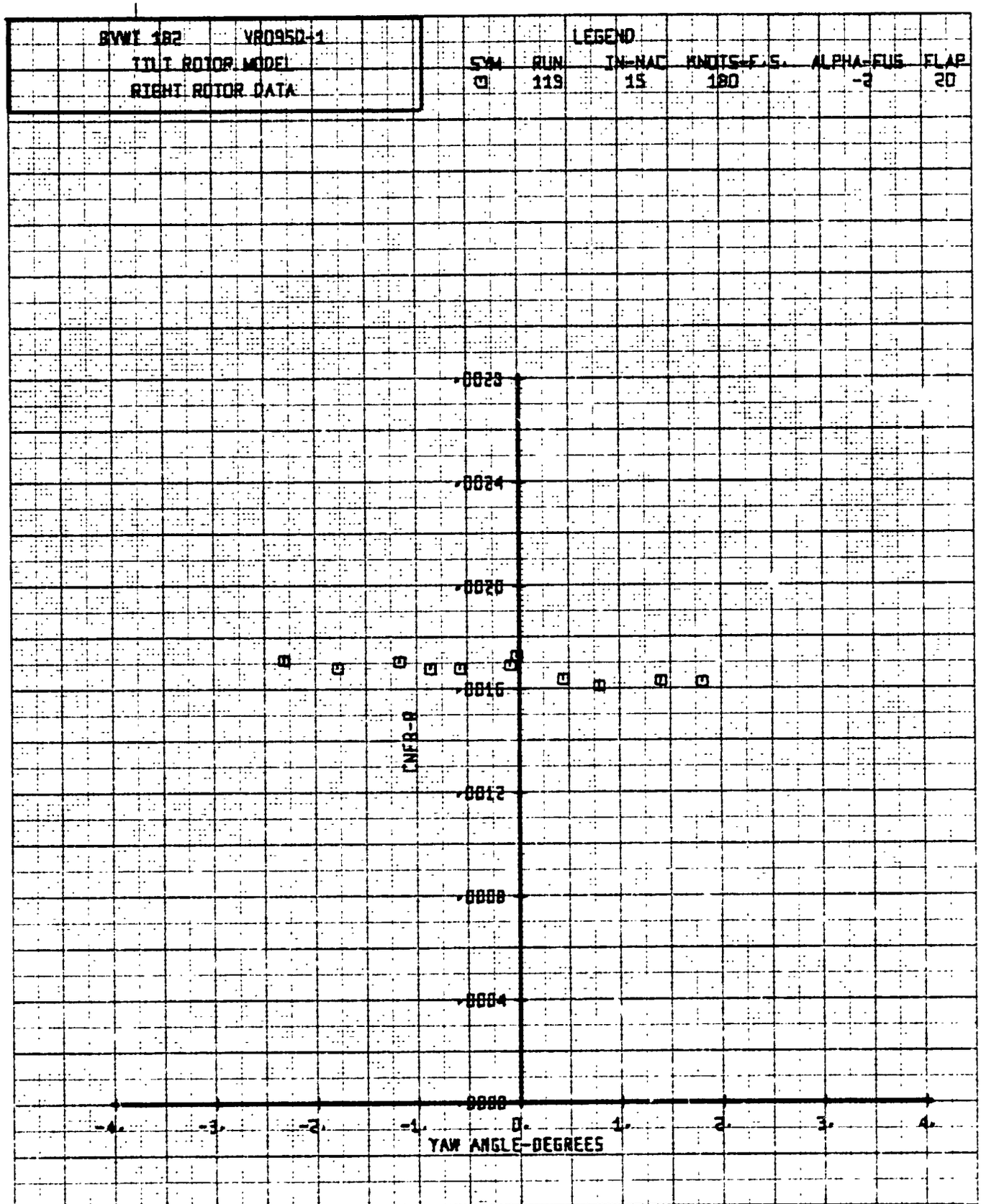


Figure 12-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Krots.

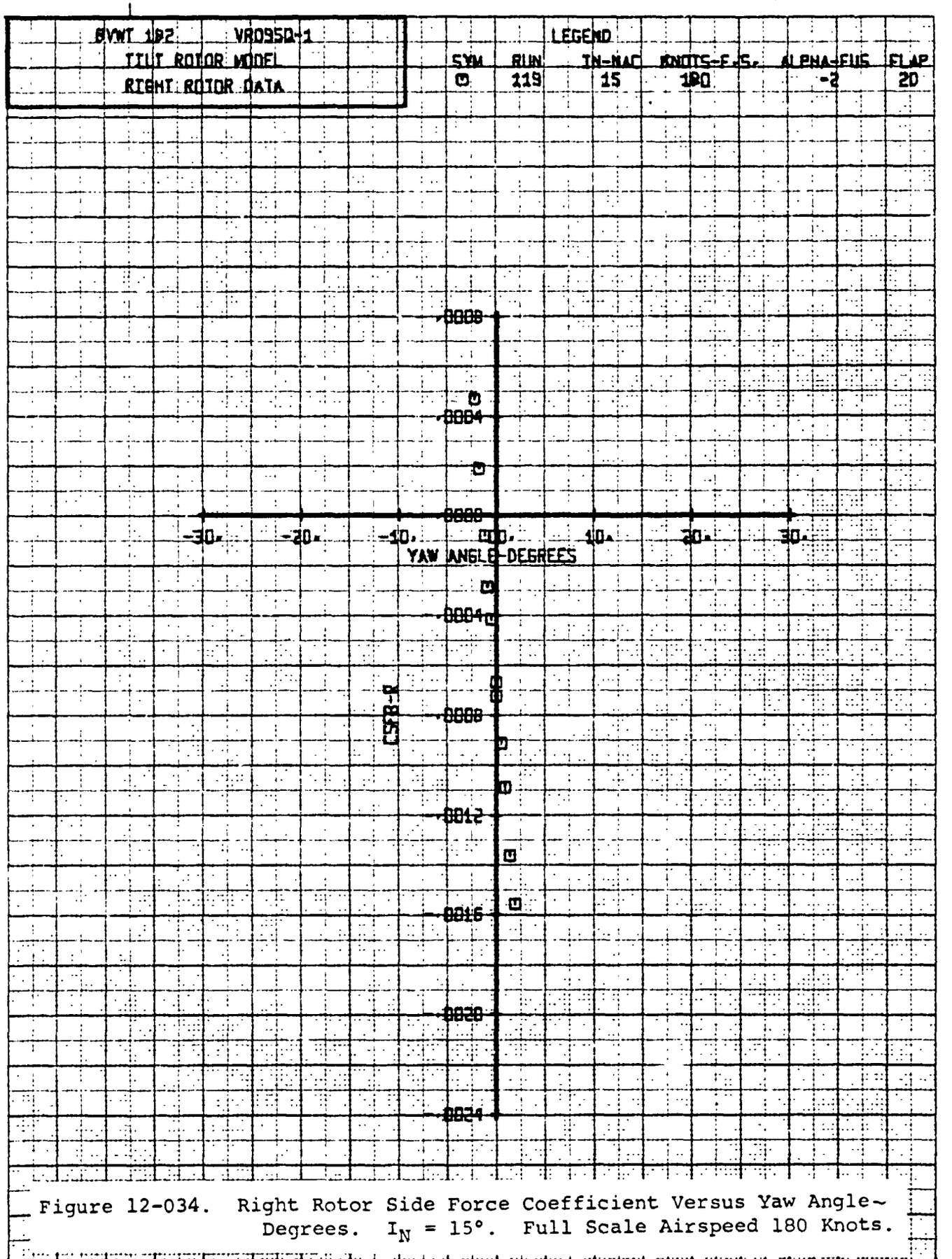


Figure 12-034. Right Rotor Side Force Coefficient Versus Yaw Angle~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

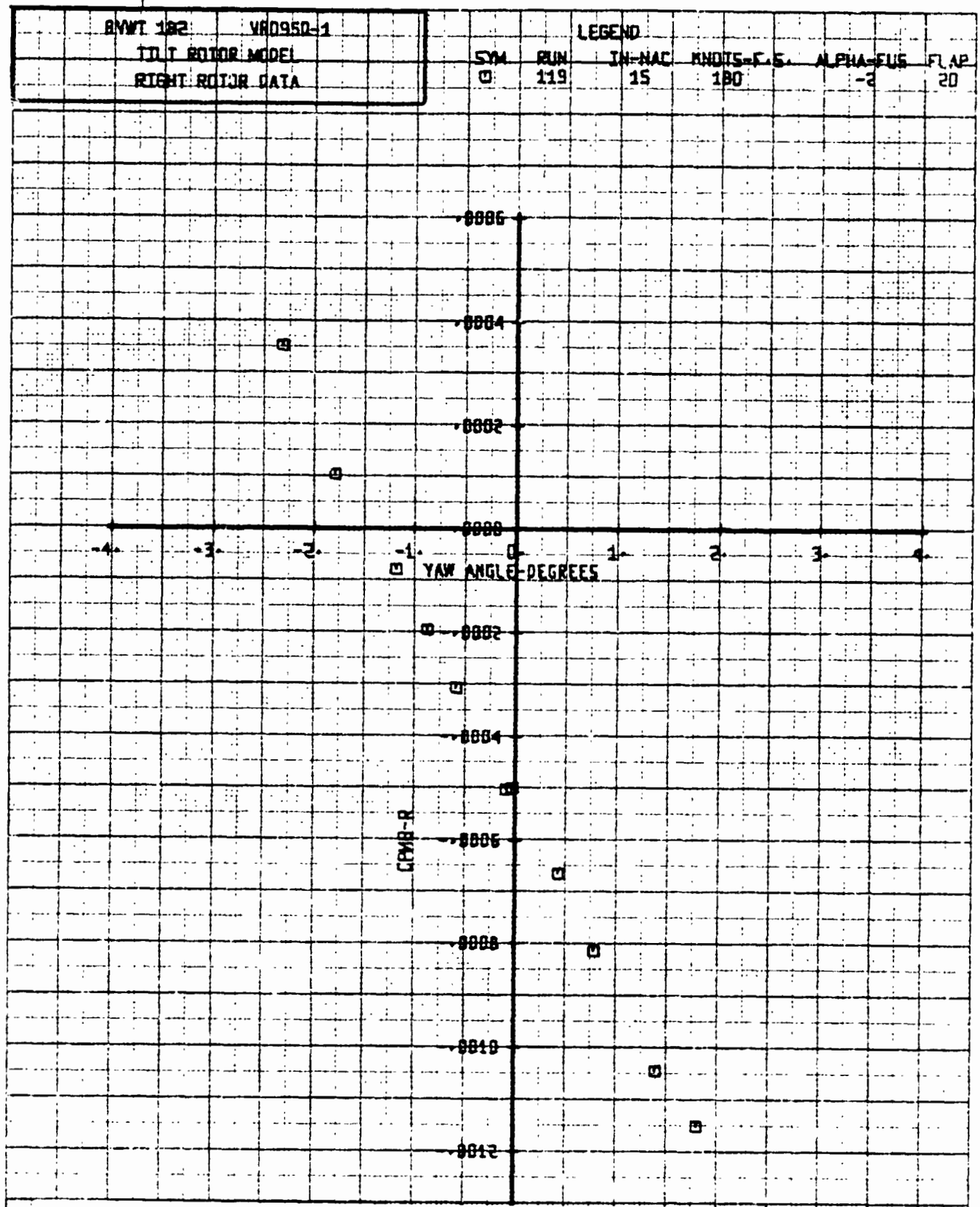


Figure 12-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

SET 78
BVWT 182

SET 78
BVWT 182

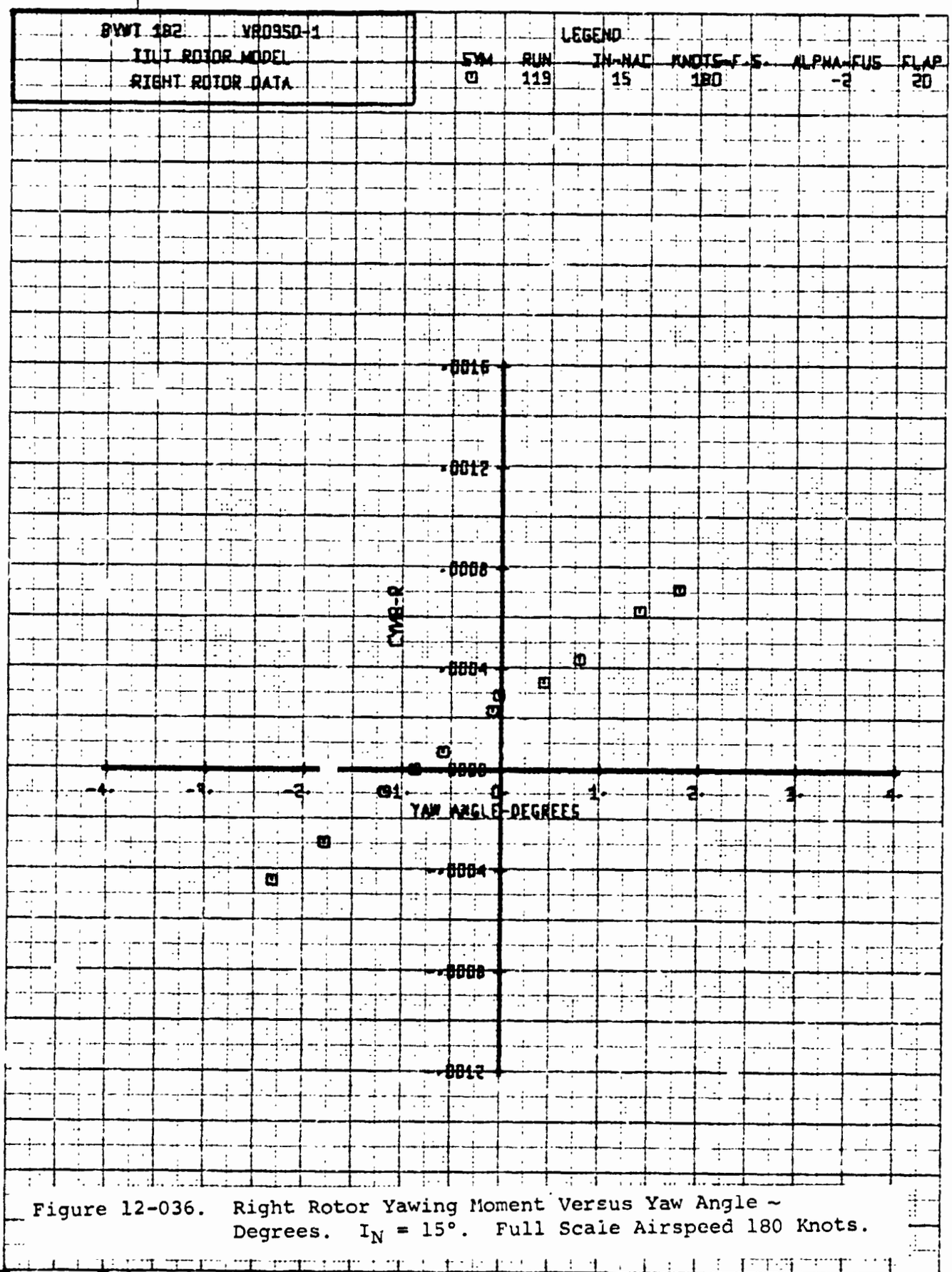


Figure 12-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

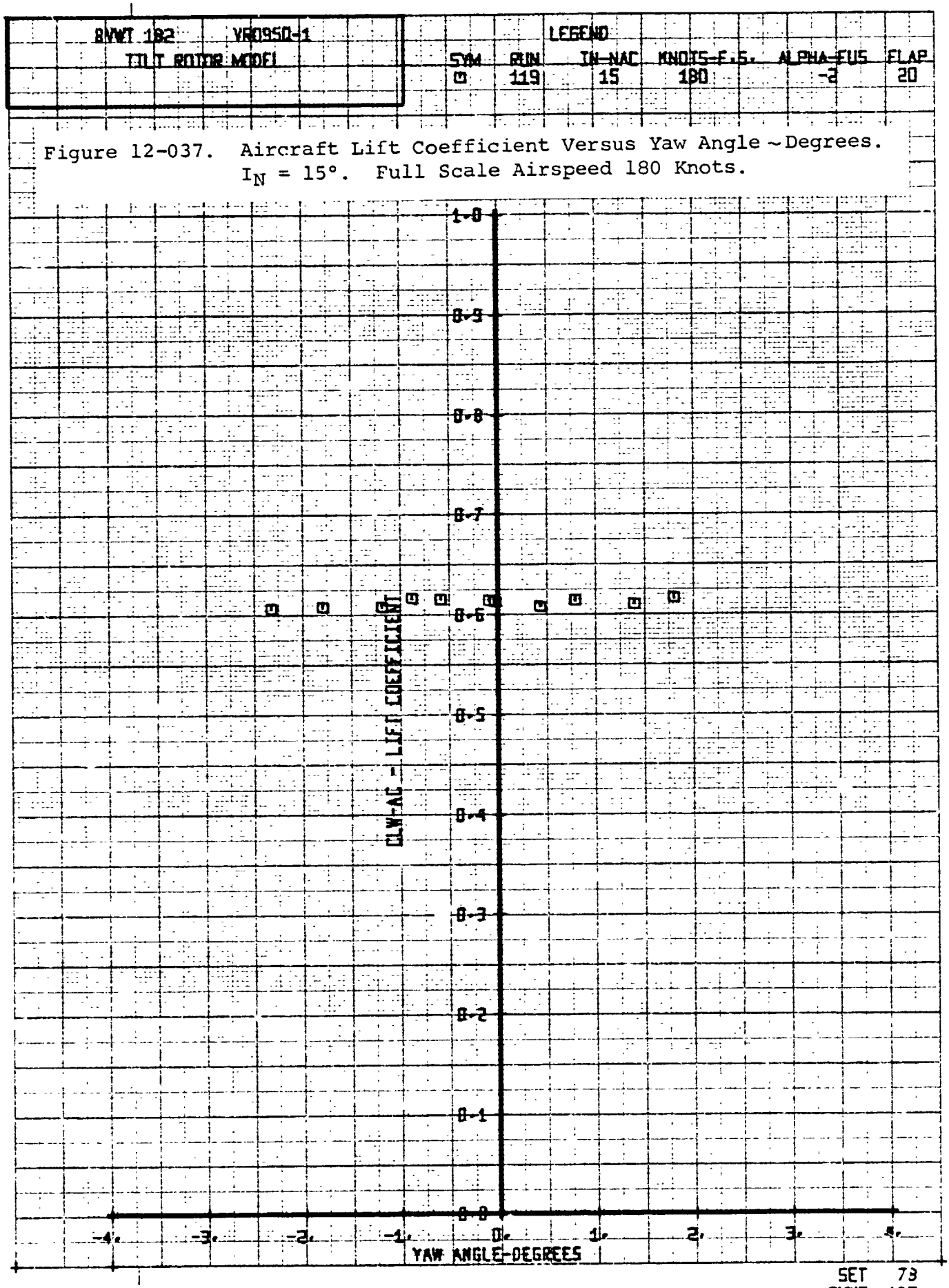


Figure 12-037. Aircraft Lift Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

FT 78
182

SET 78
BVWT 182

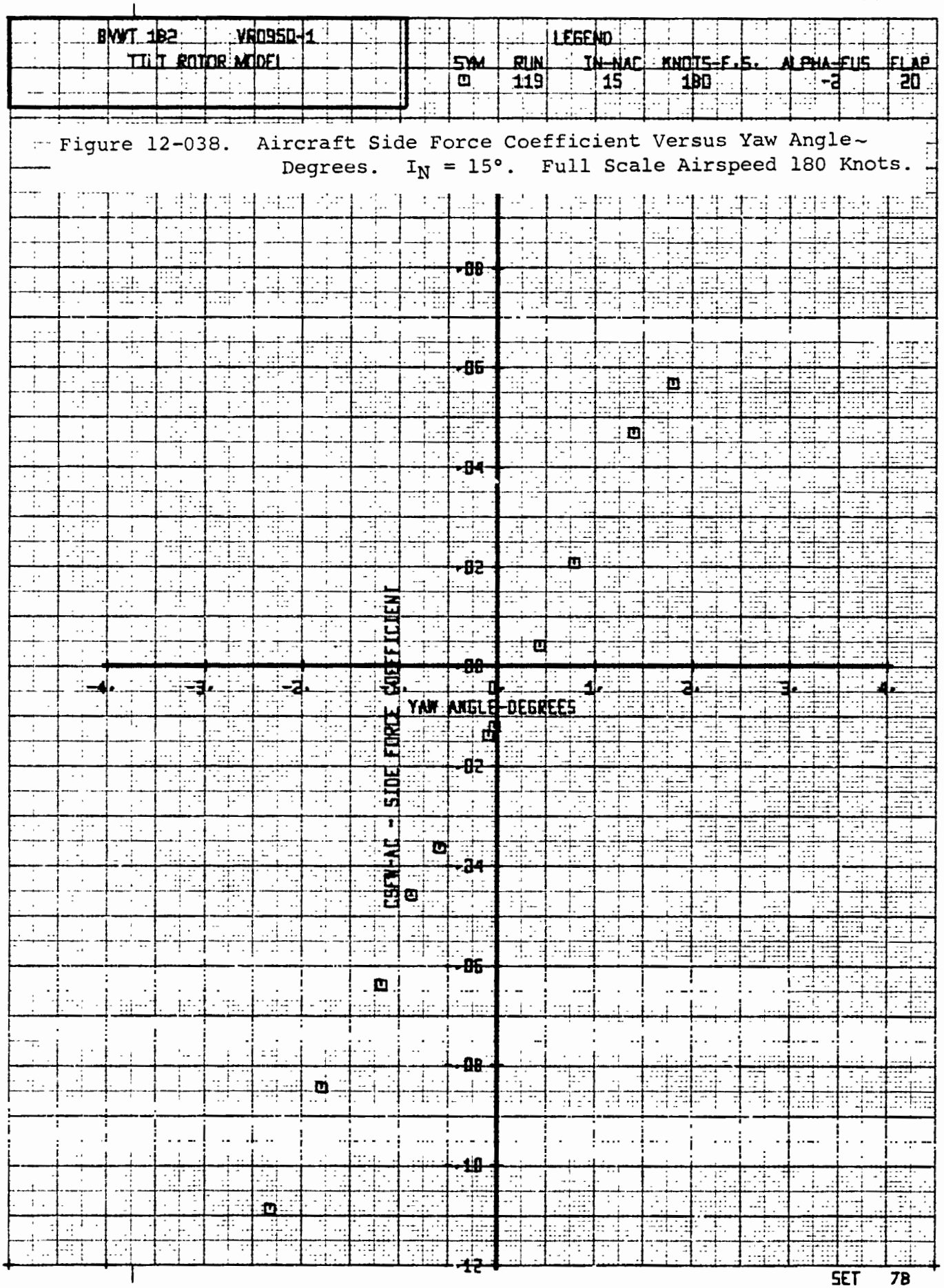


Figure 12-038. Aircraft Side Force Coefficient Versus Yaw Angle~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

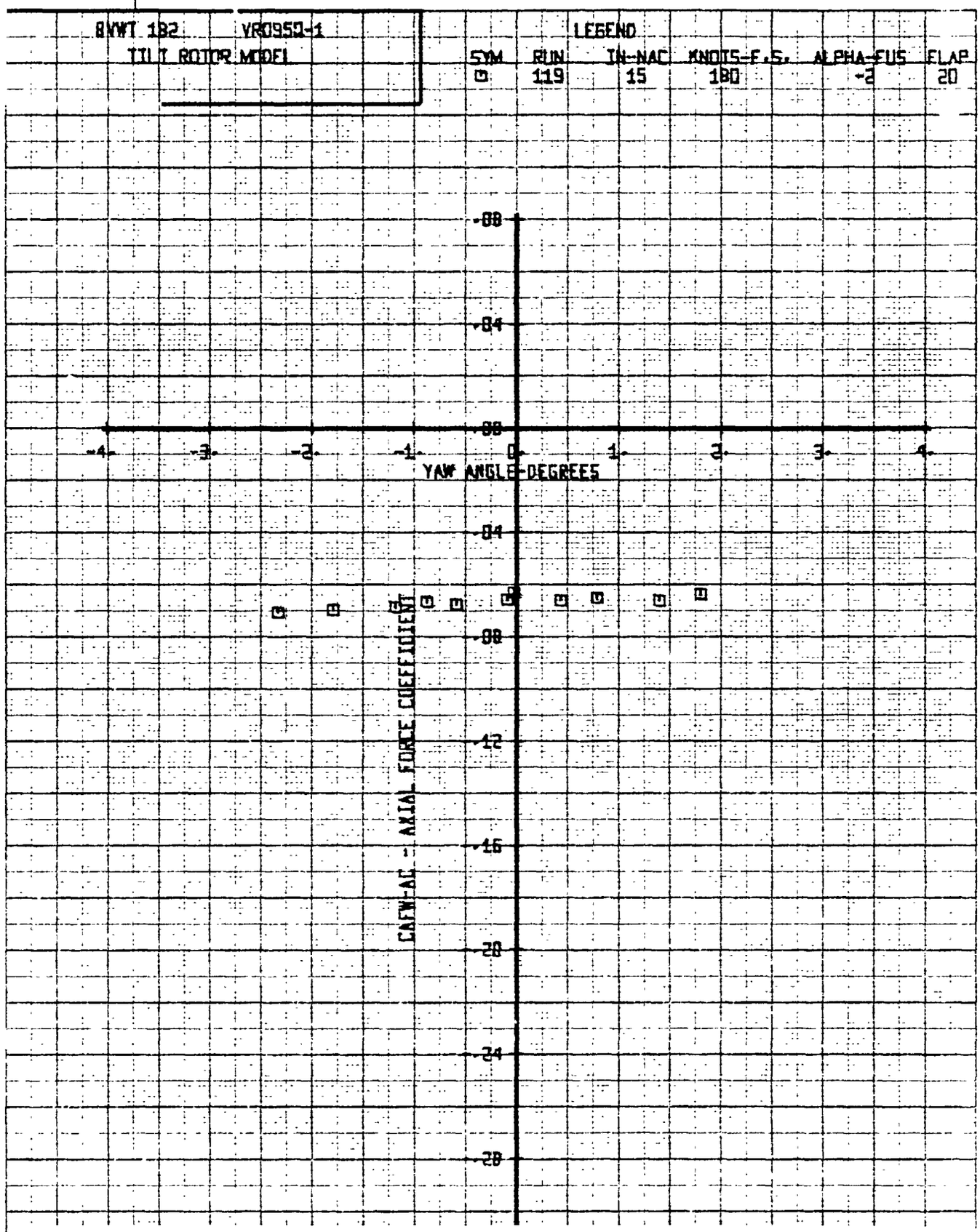


Figure 12-039. Aircraft Axial Force Coefficient Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

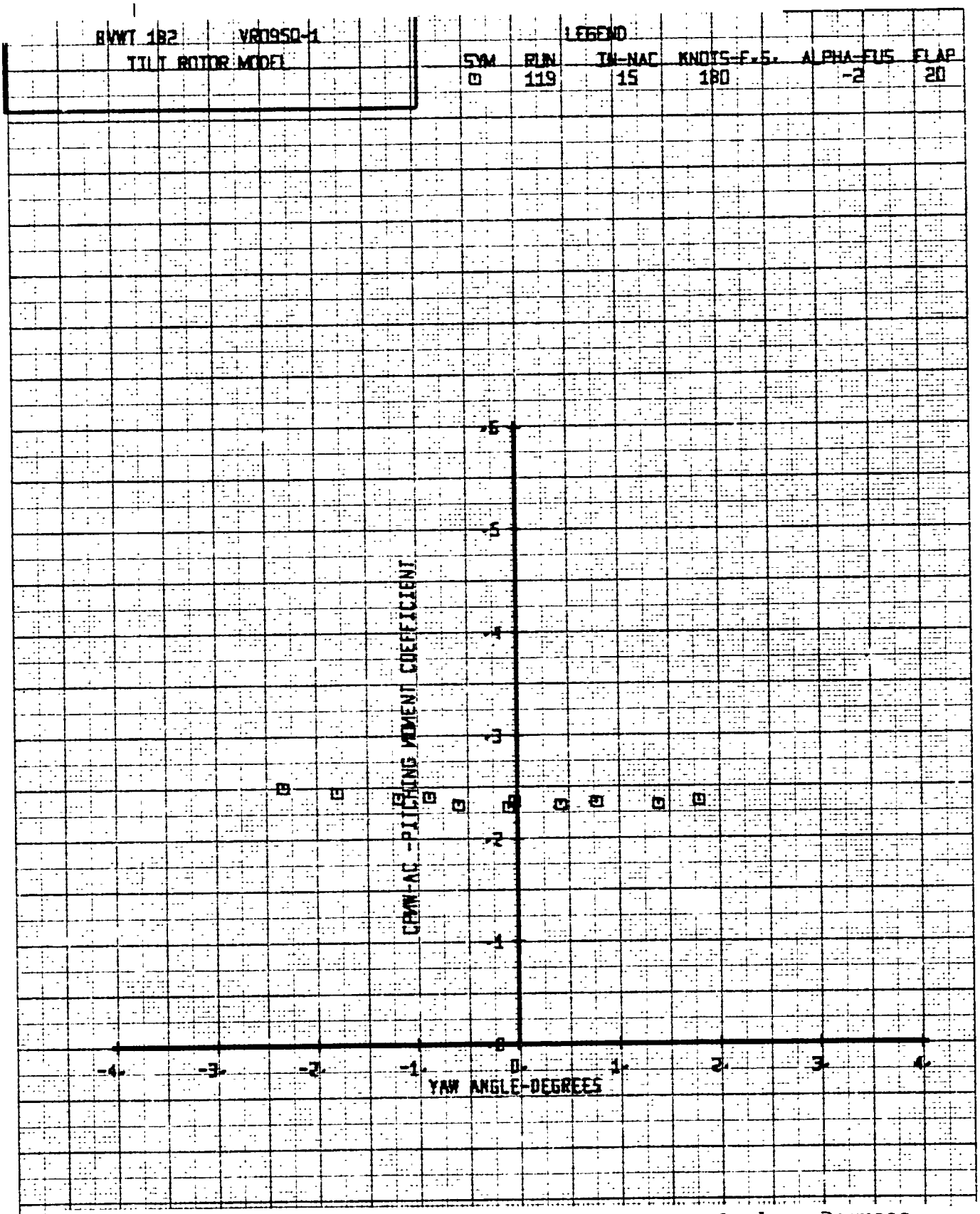


Figure 12-040. Aircraft Pitching Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

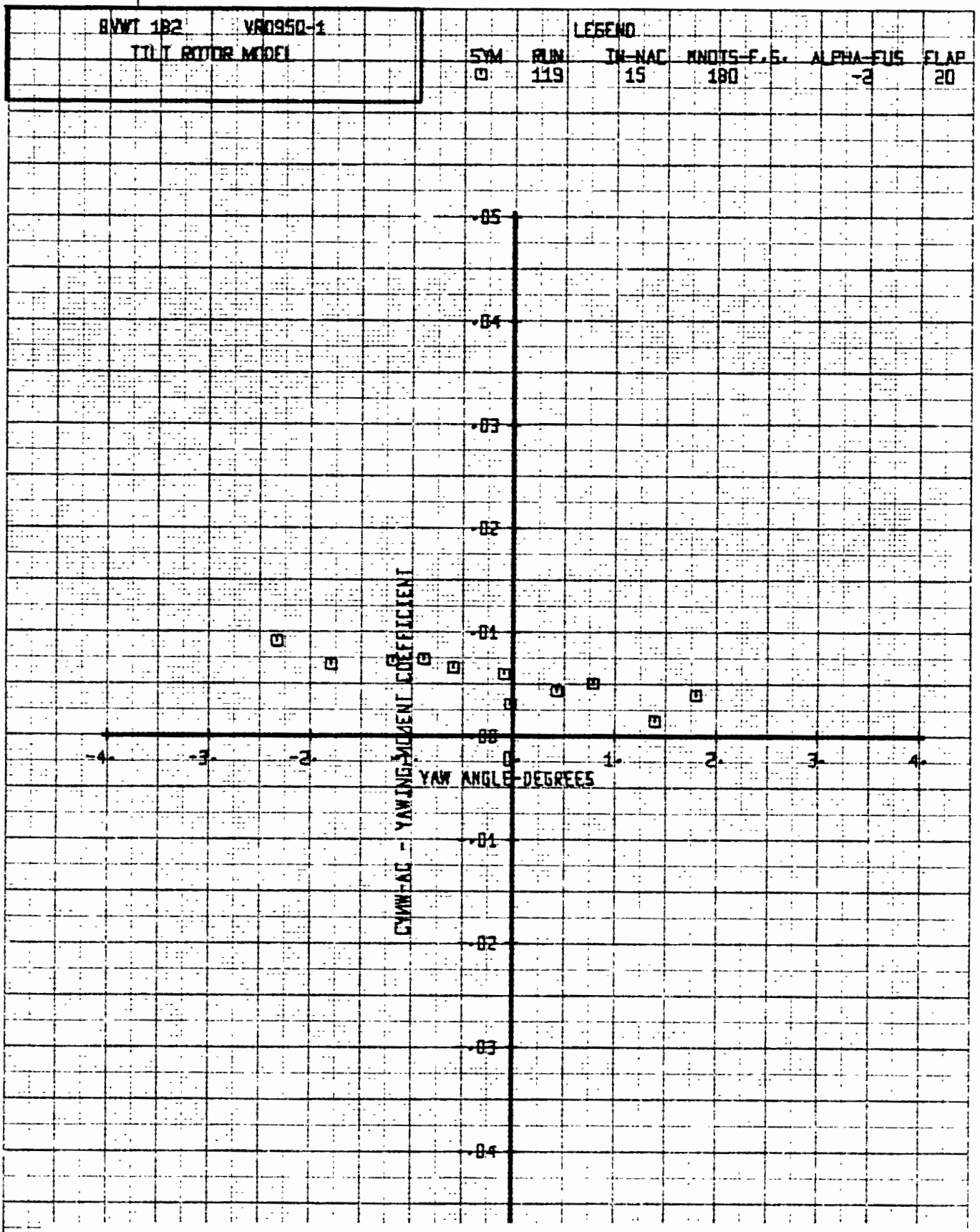


Figure 12-041. Aircraft Yawing Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

ET 78
W 182

SET 78
BVWT 182

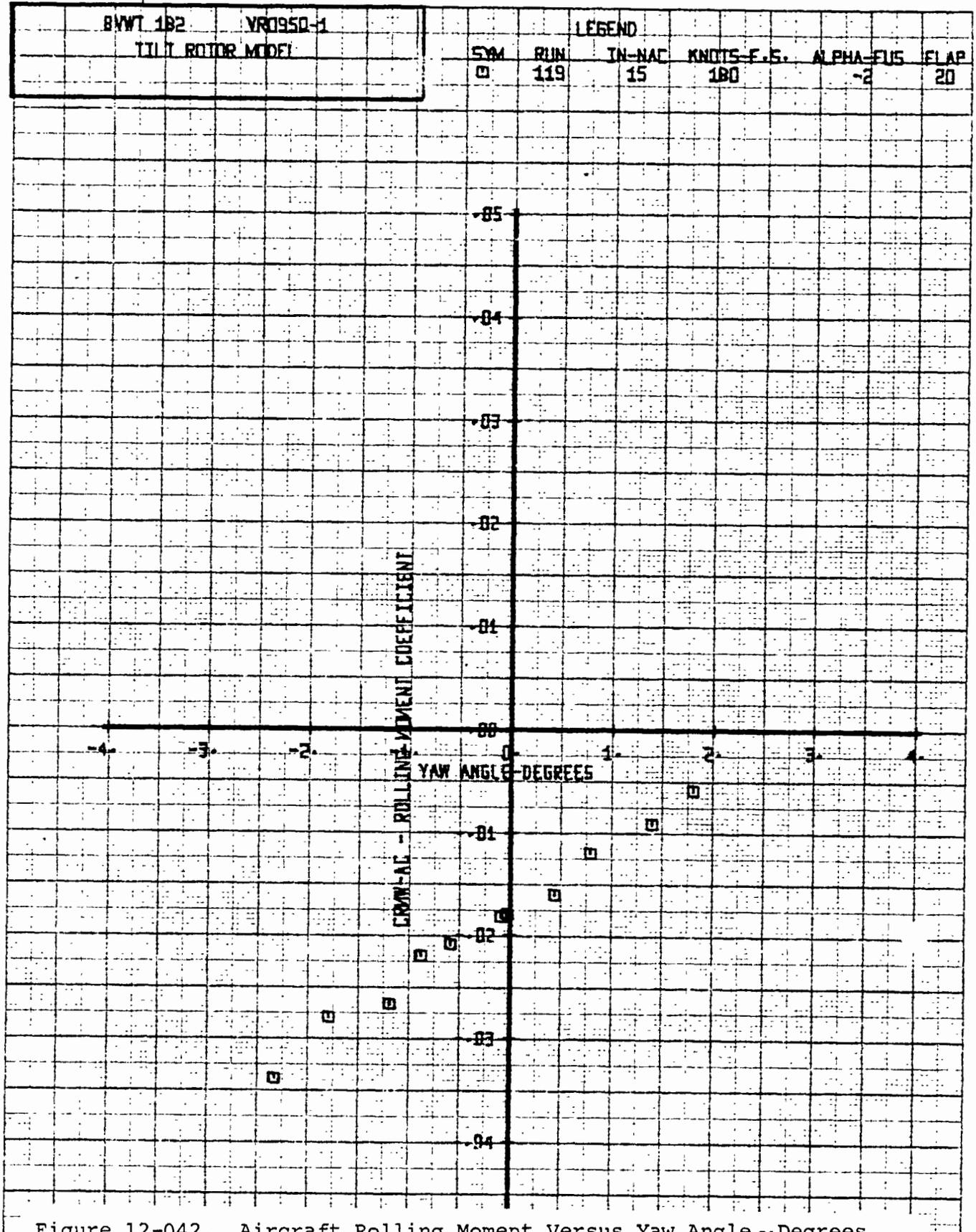


Figure 12-042. Aircraft Rolling Moment Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

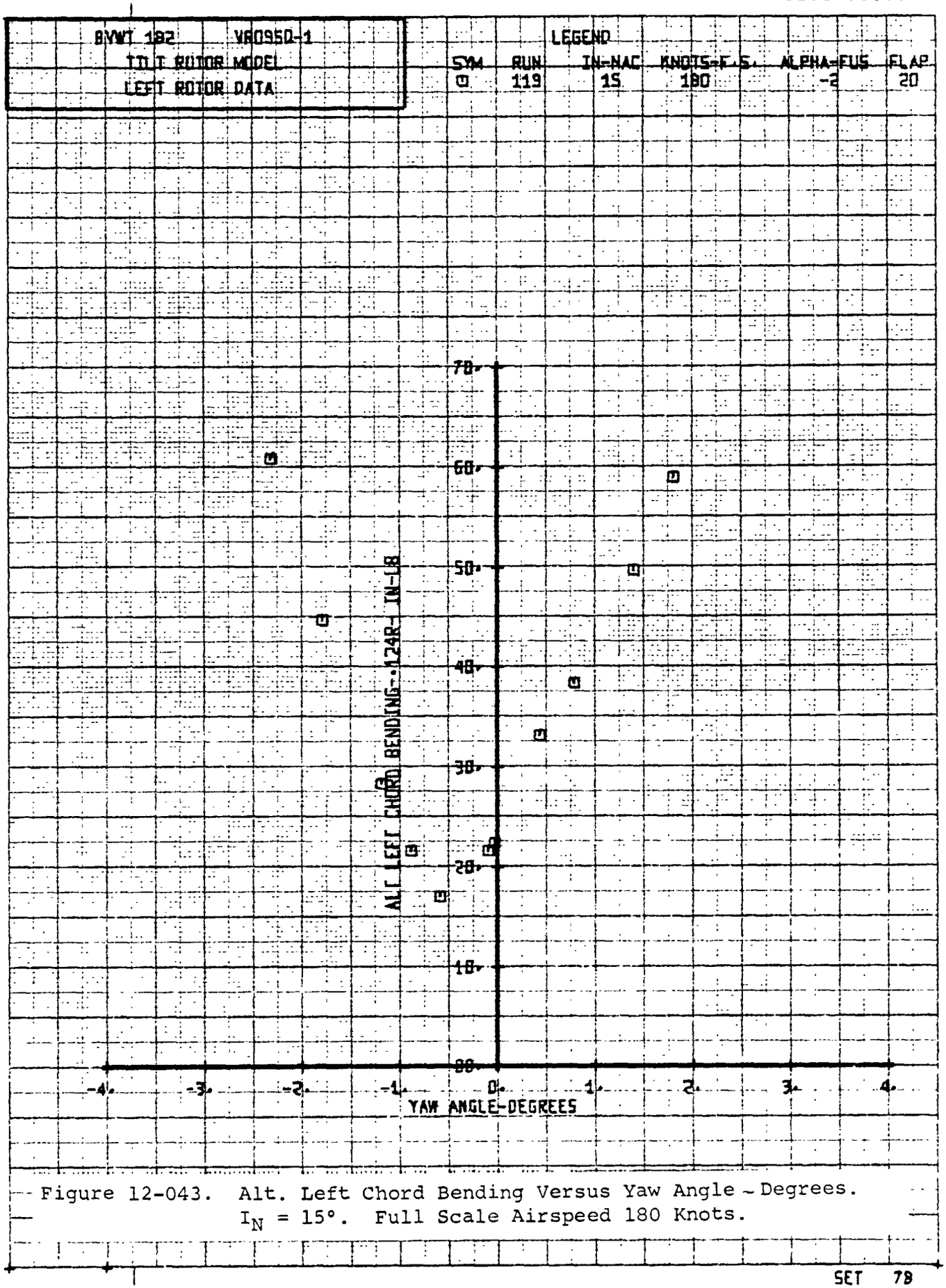


Figure 12-043. Alt. Left Chord Bending Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

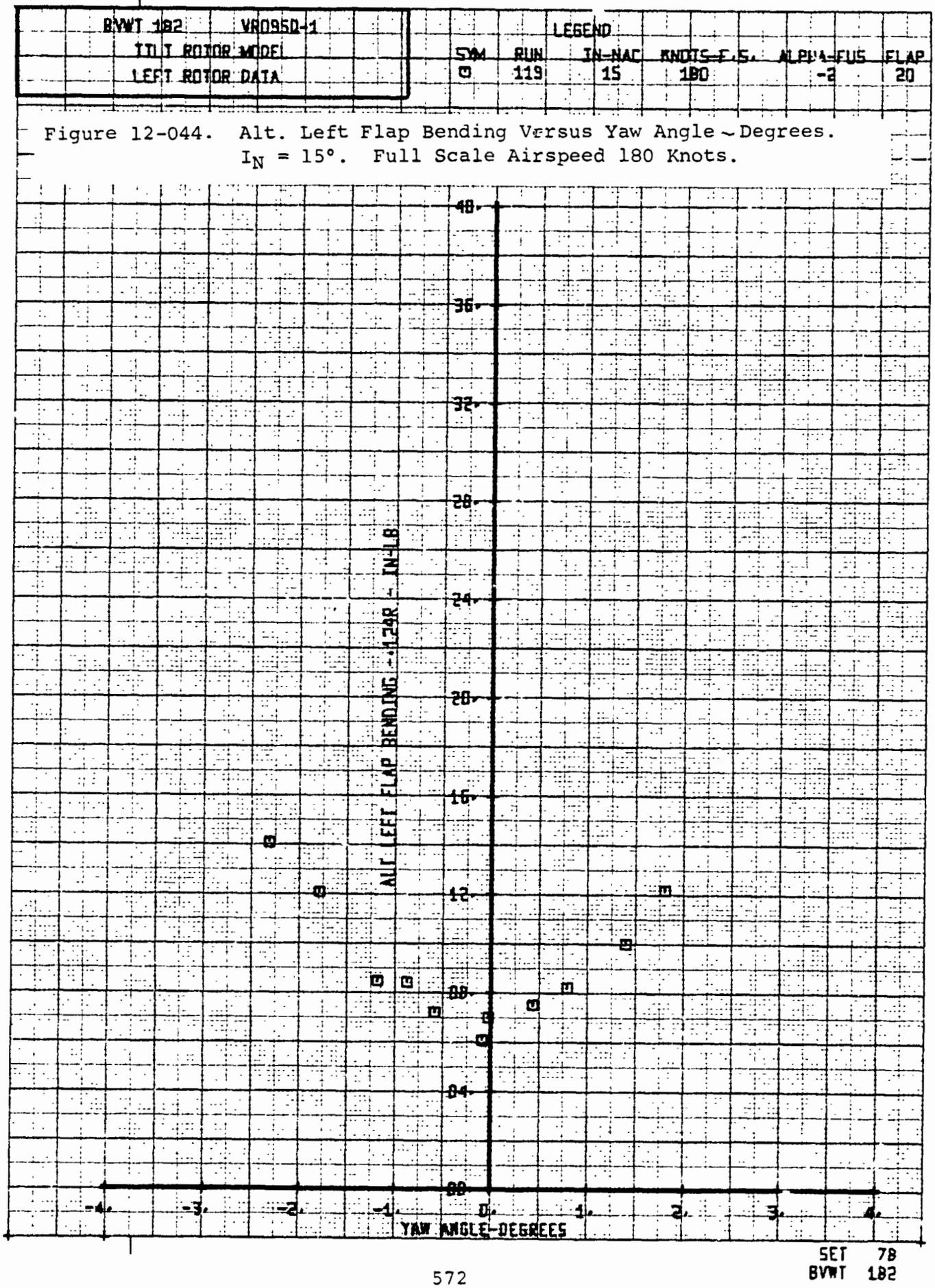


Figure 12-044. Alt. Left Flap Bending Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

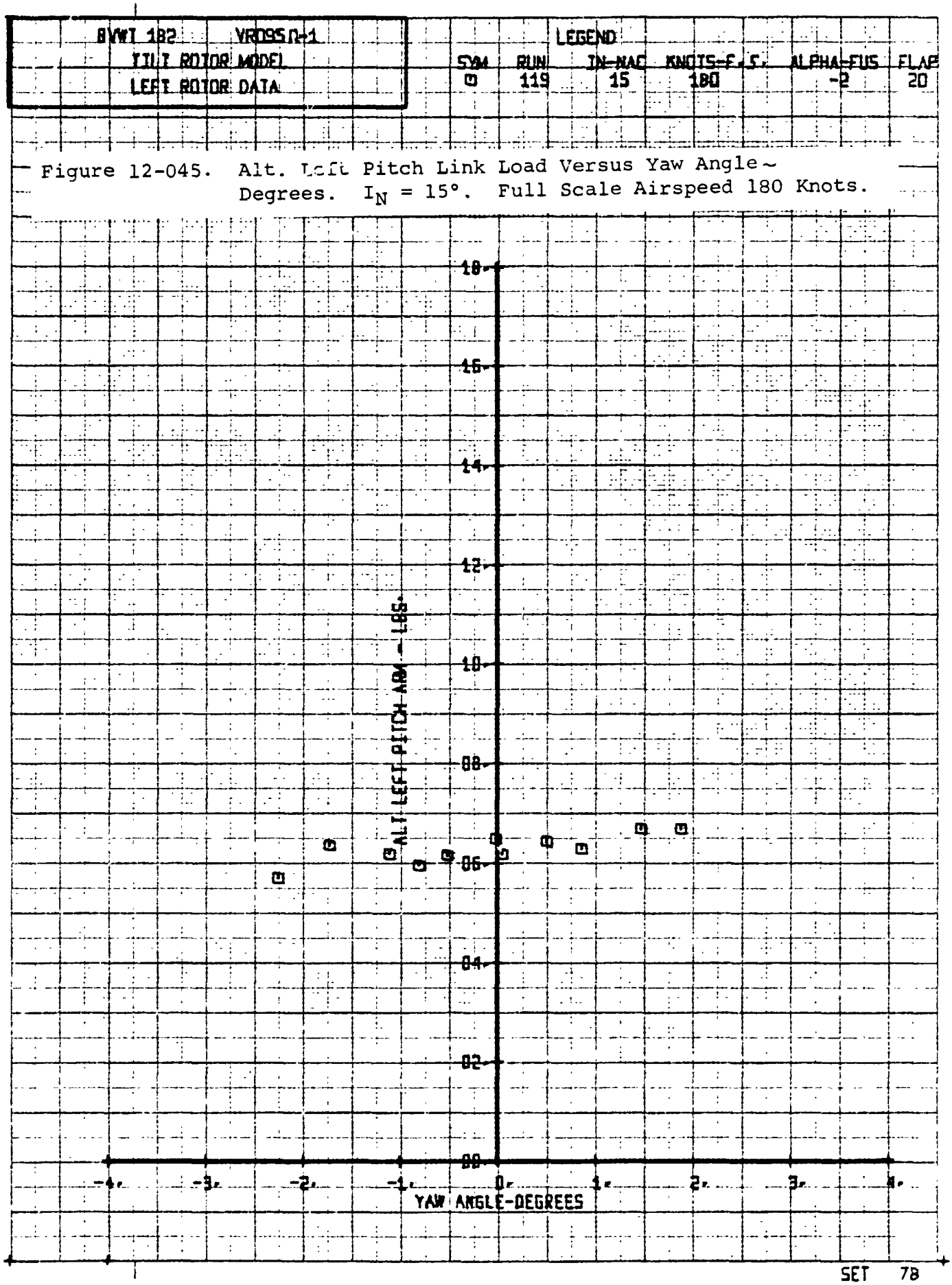


Figure 12-045. Alt. Left Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

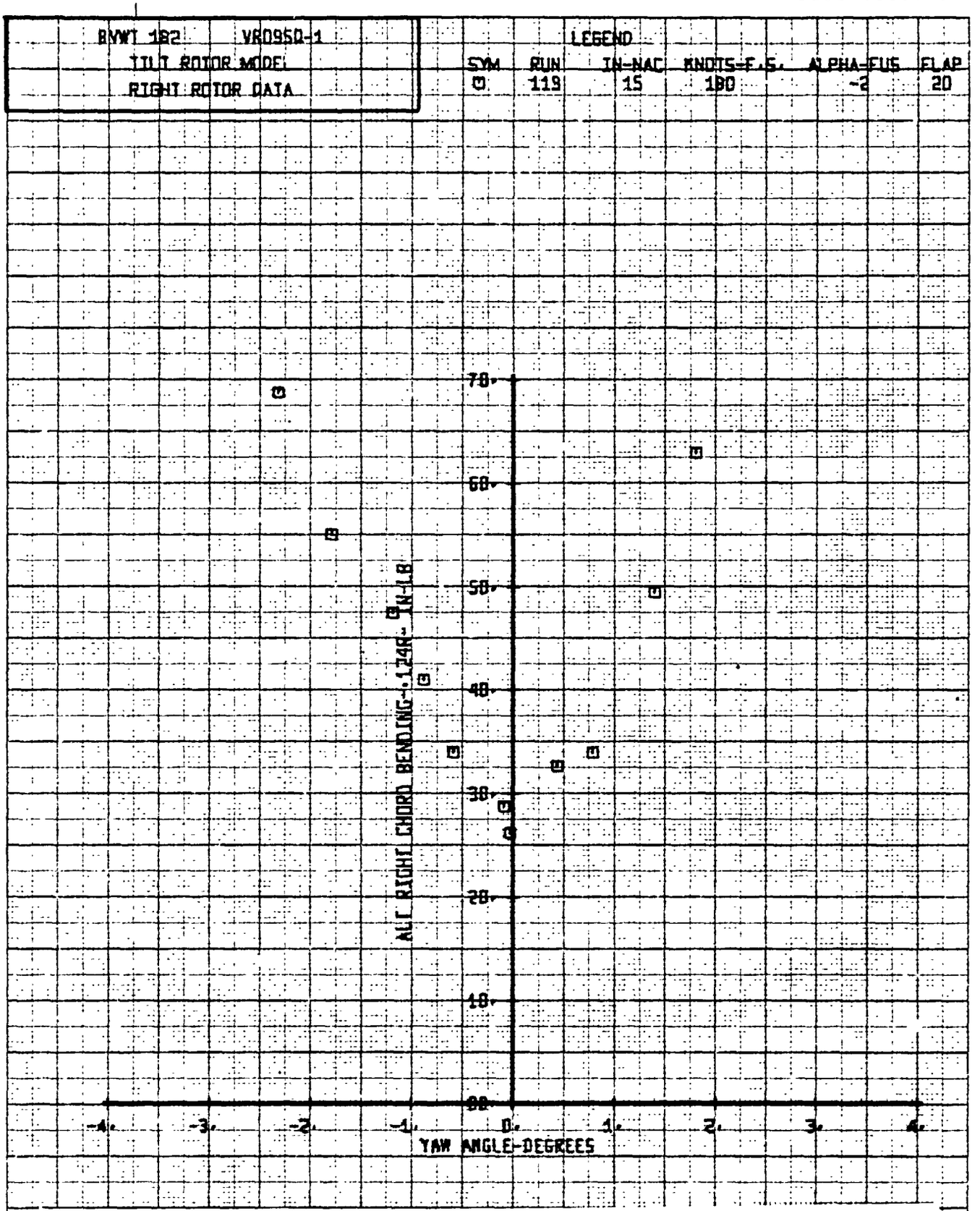


Figure 12-046. Alt. Right Chord Bending Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

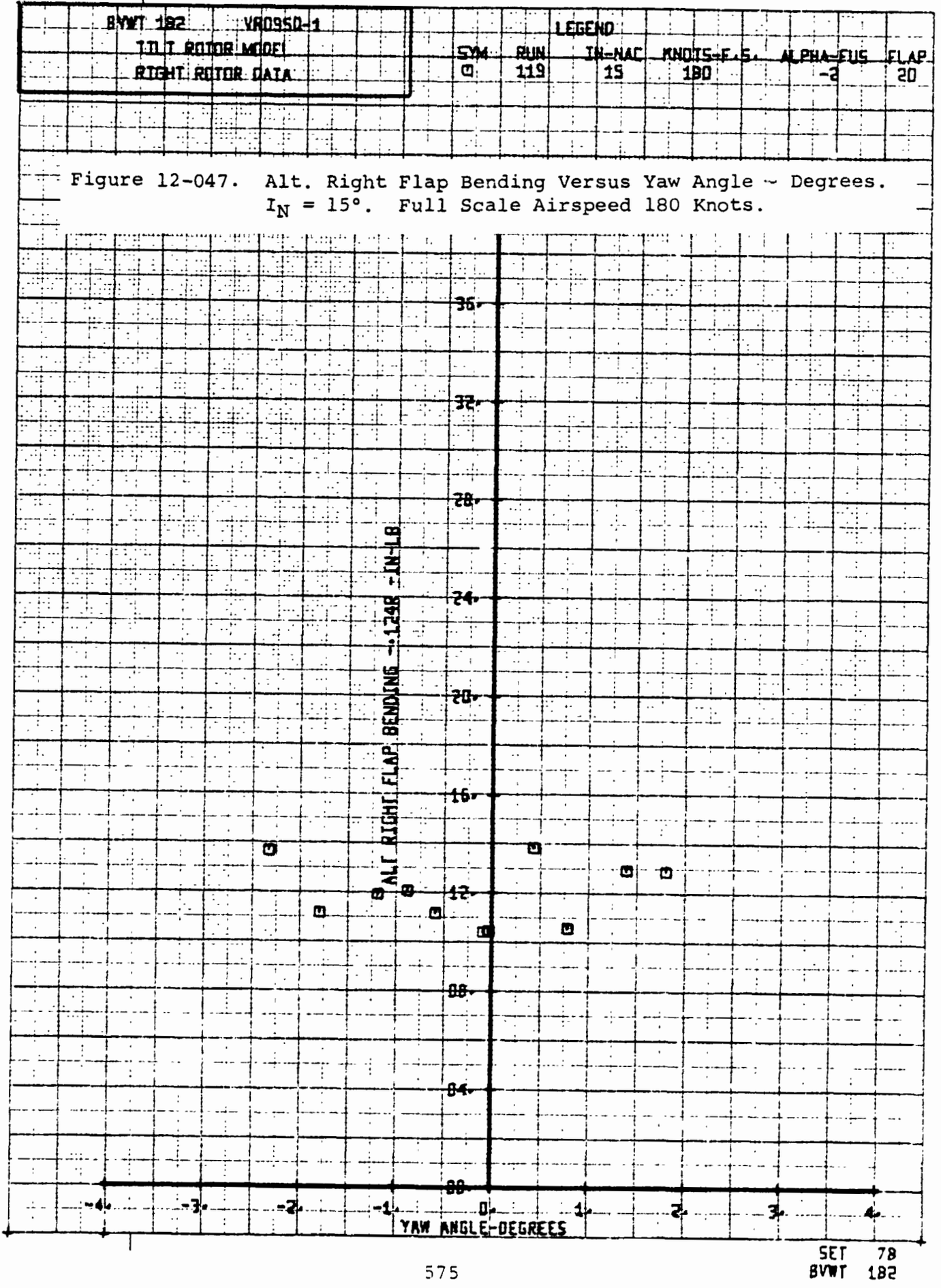


Figure 12-047. Alt. Right Flap Bending Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

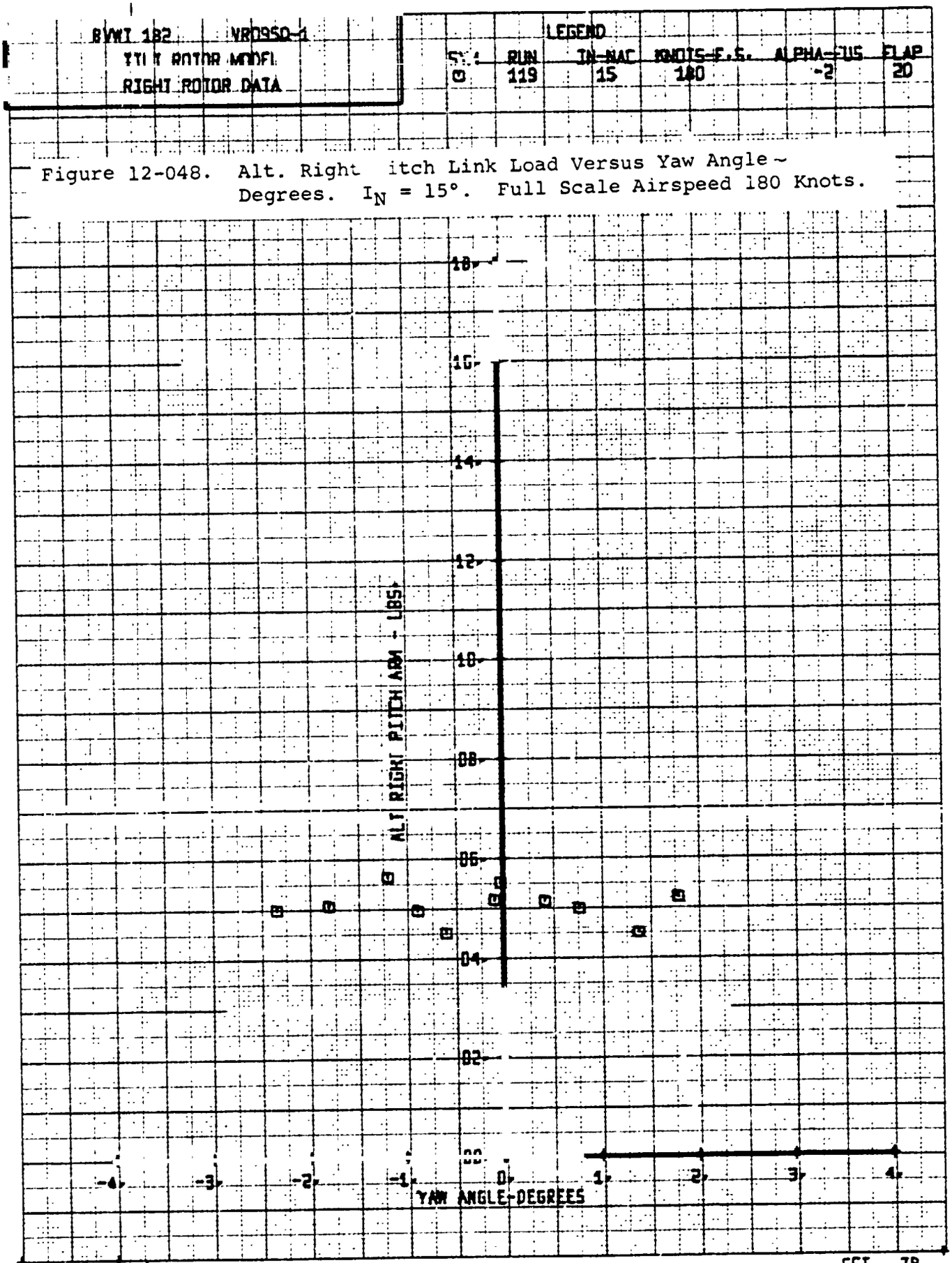


Figure 12-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

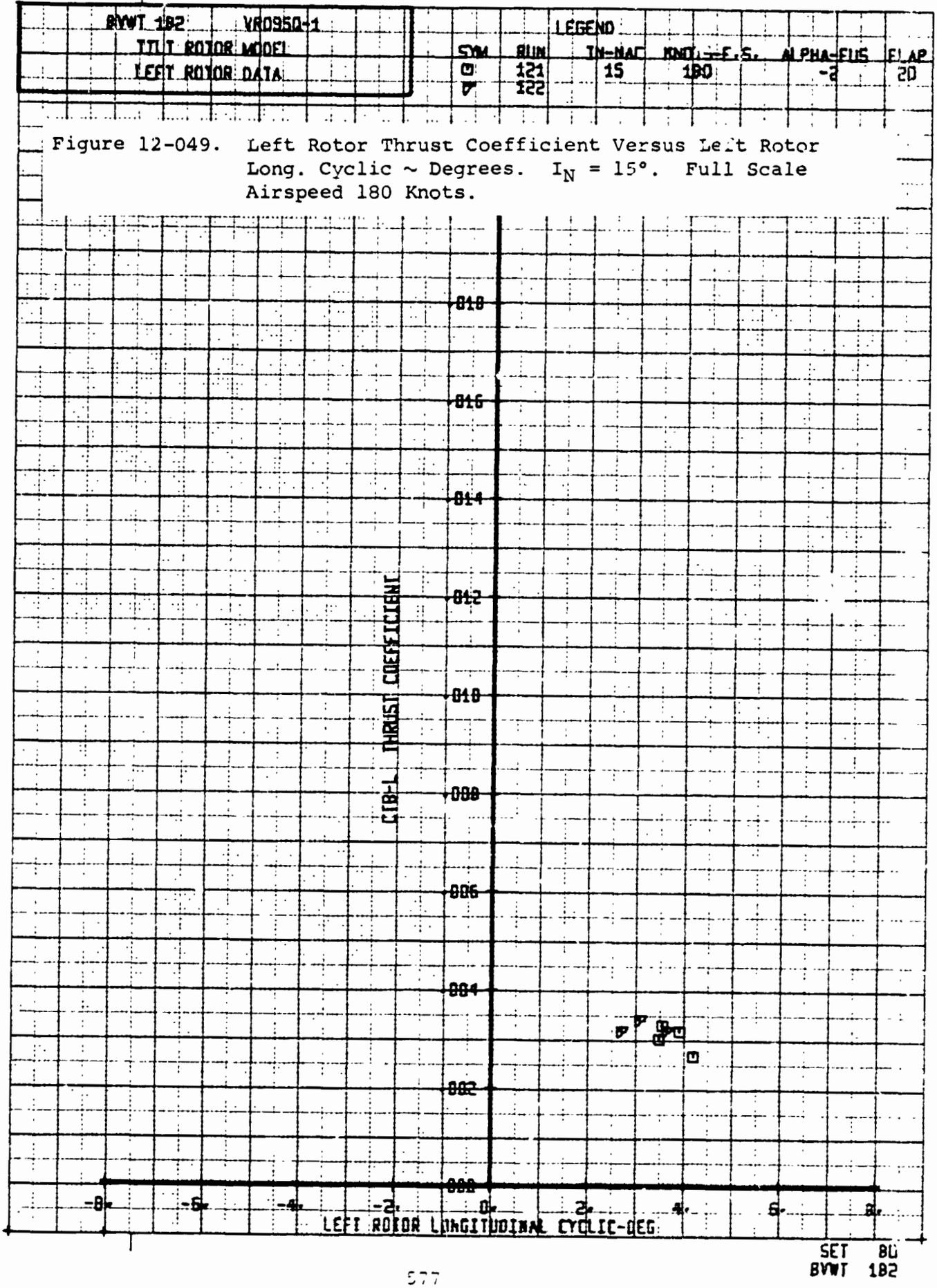


Figure 12-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

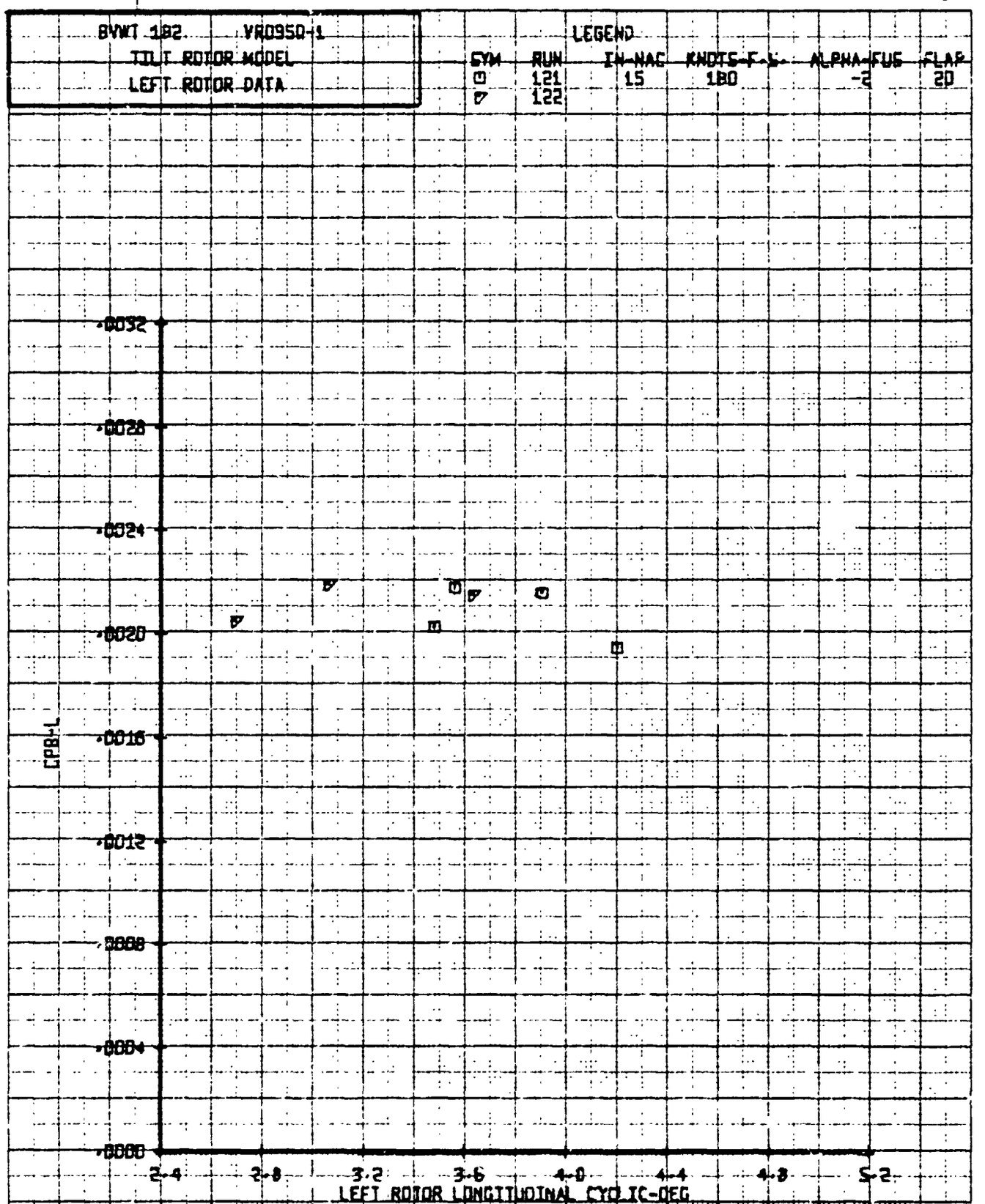


Figure 12-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airsp(180 Knots.

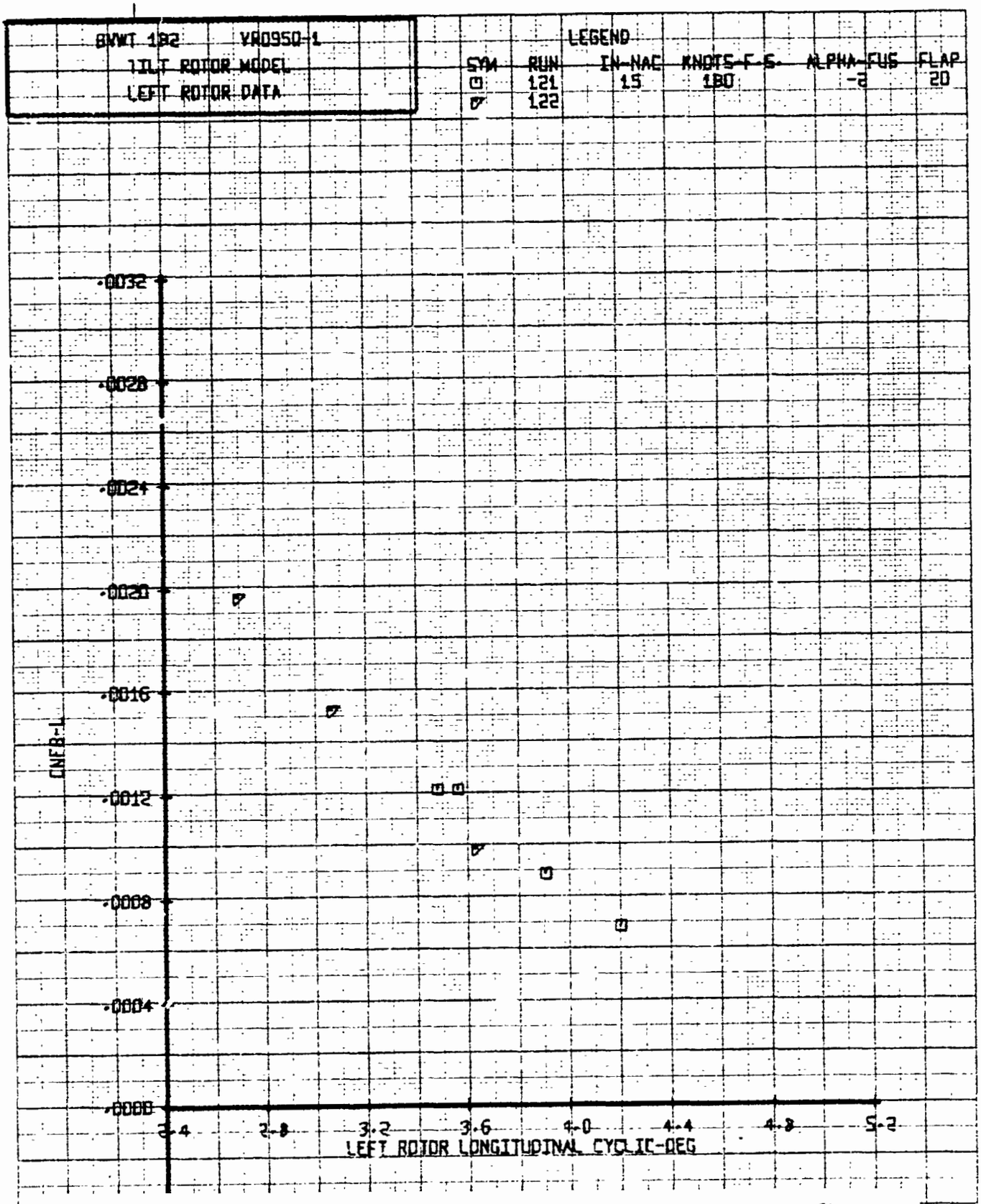


Figure 12-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

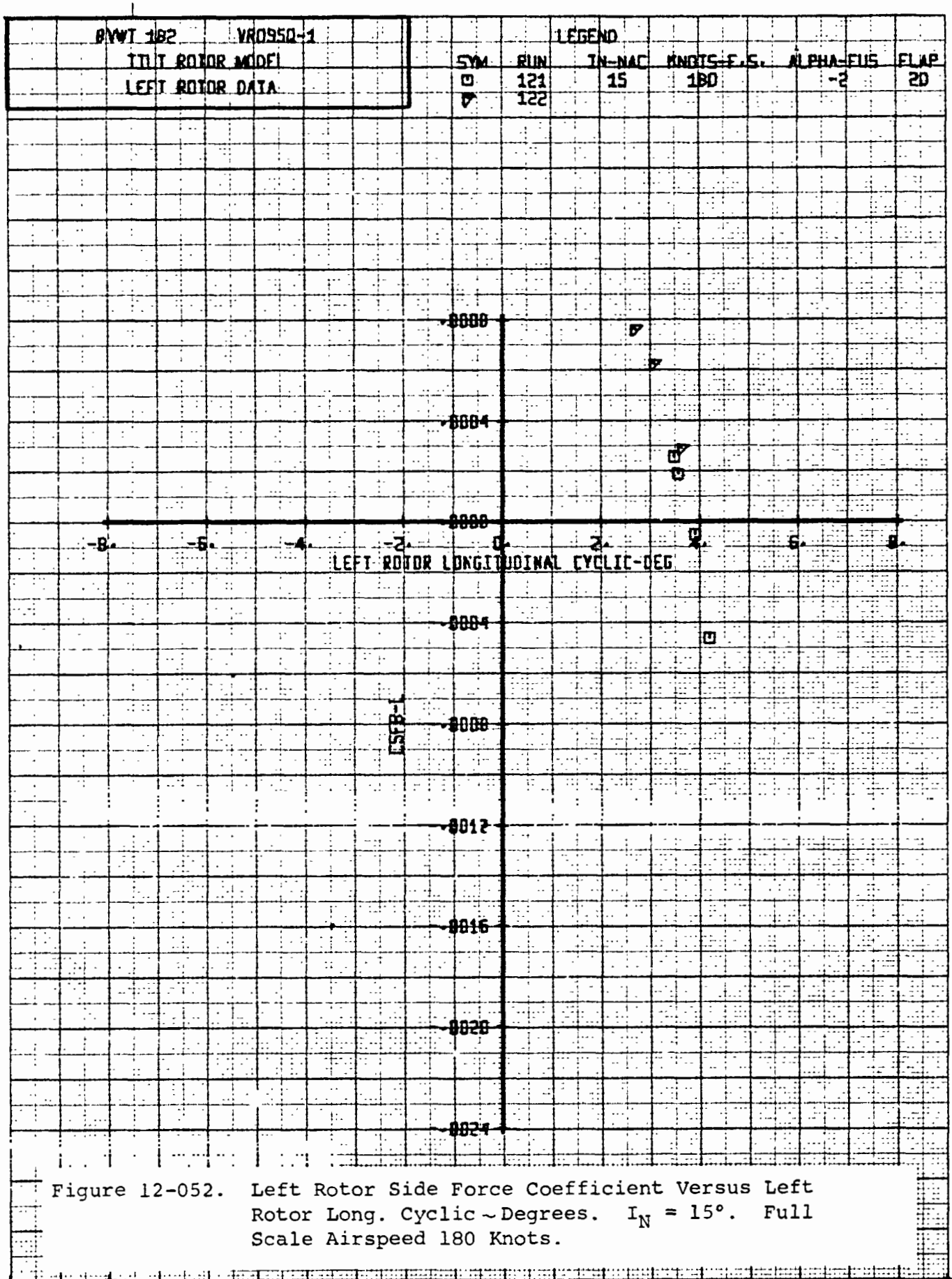


Figure 12-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

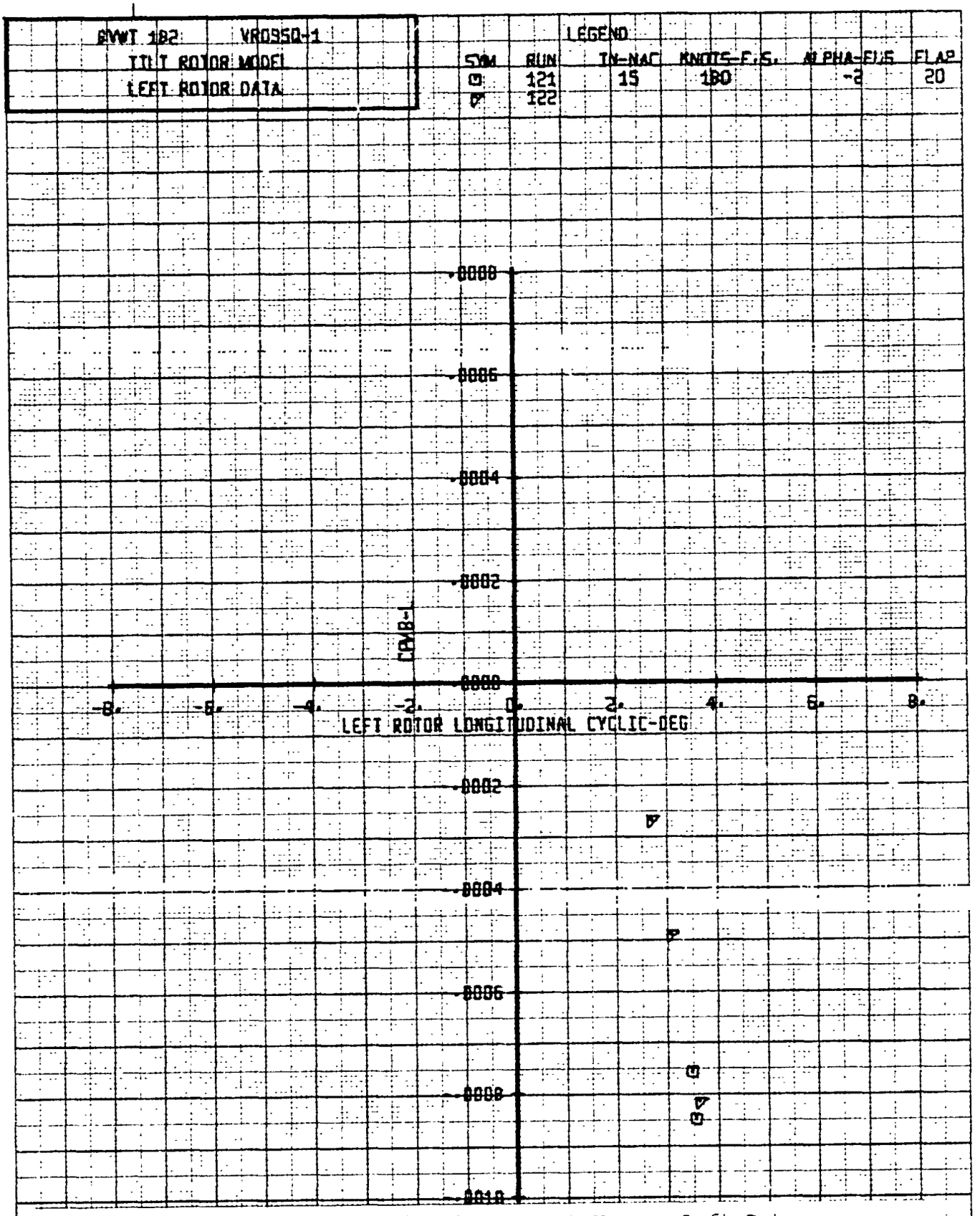


Figure 12-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

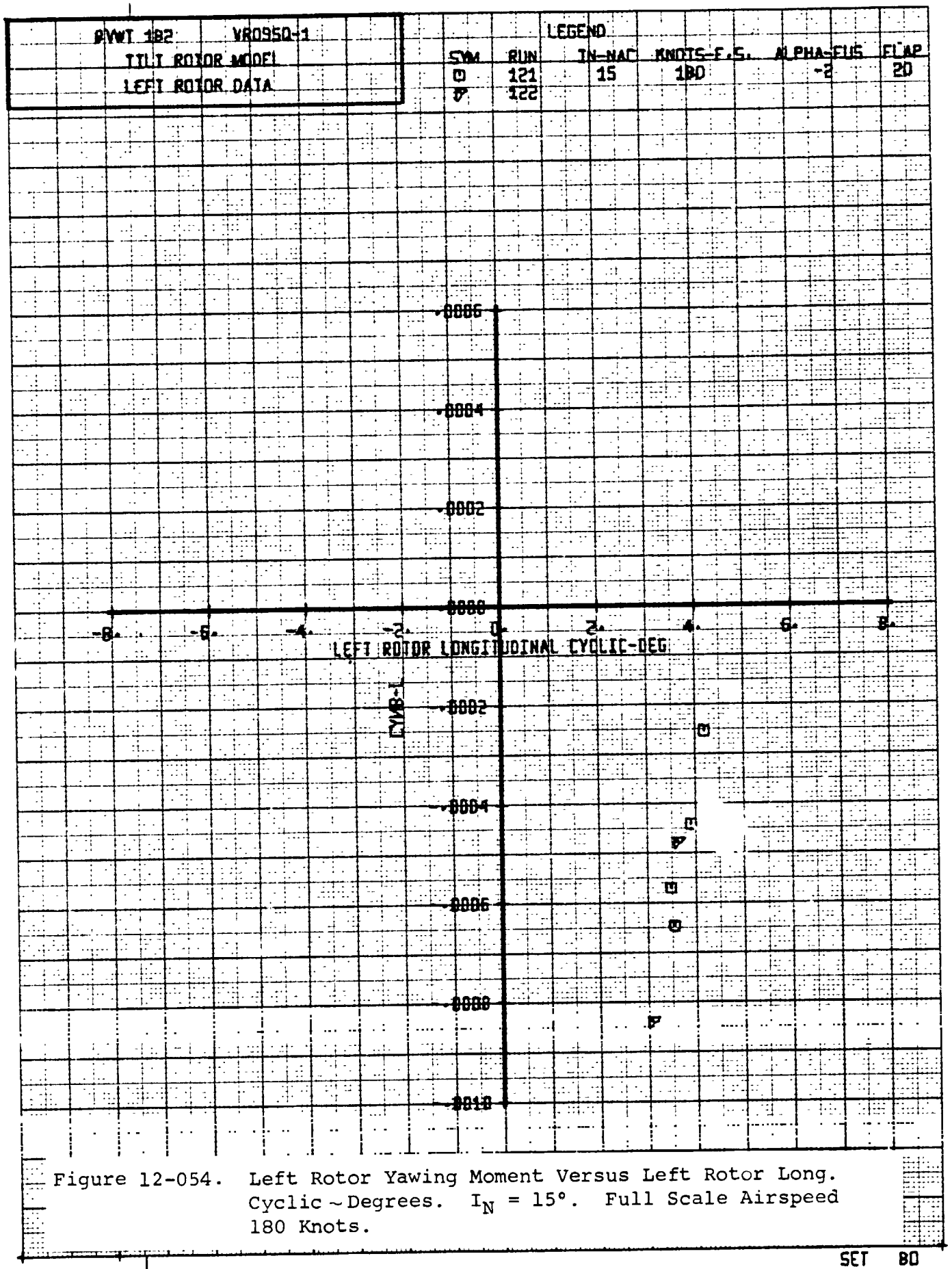
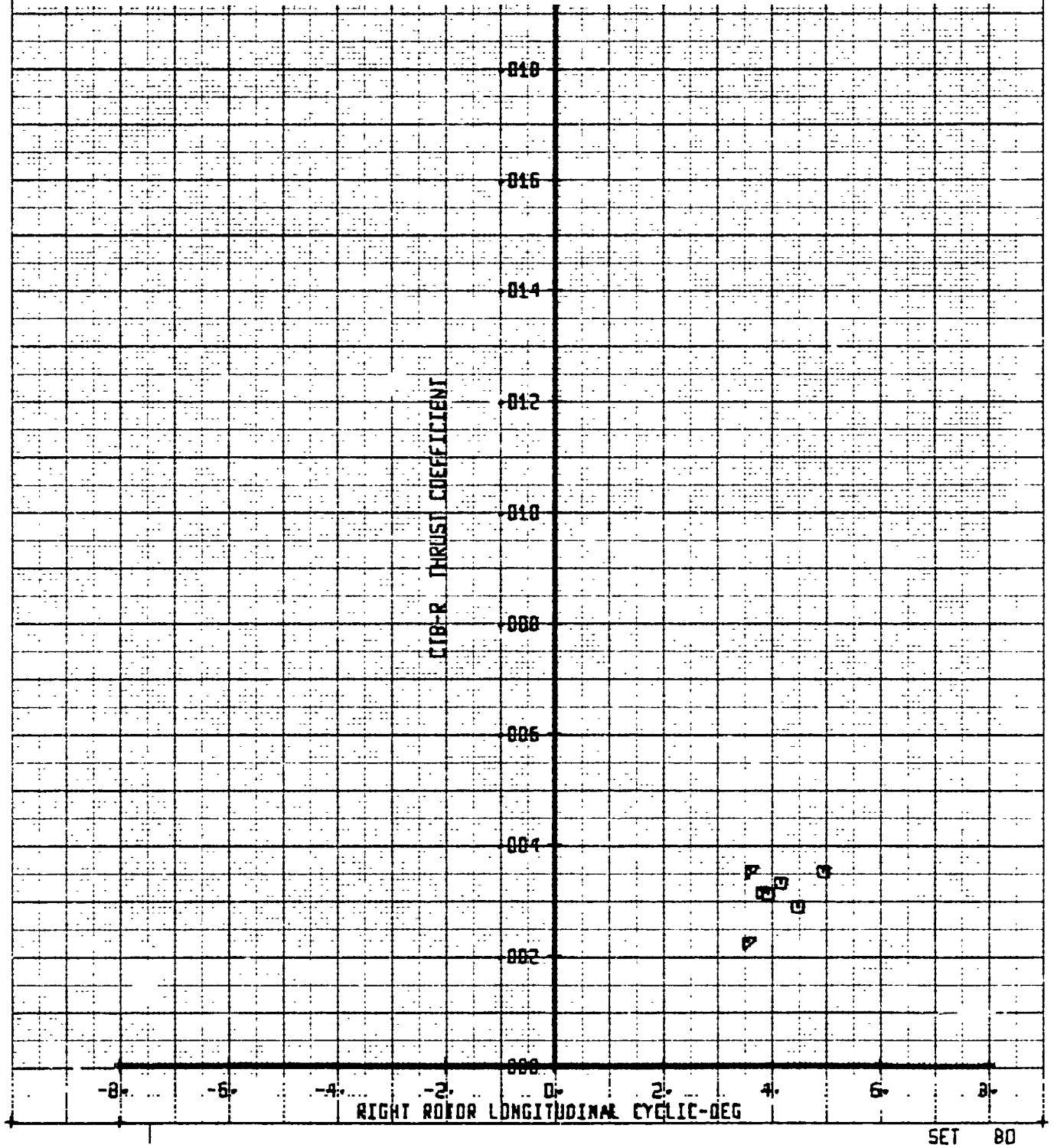


Figure 12-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	121	15	180	-2	20
▽	122				

Figure 12-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



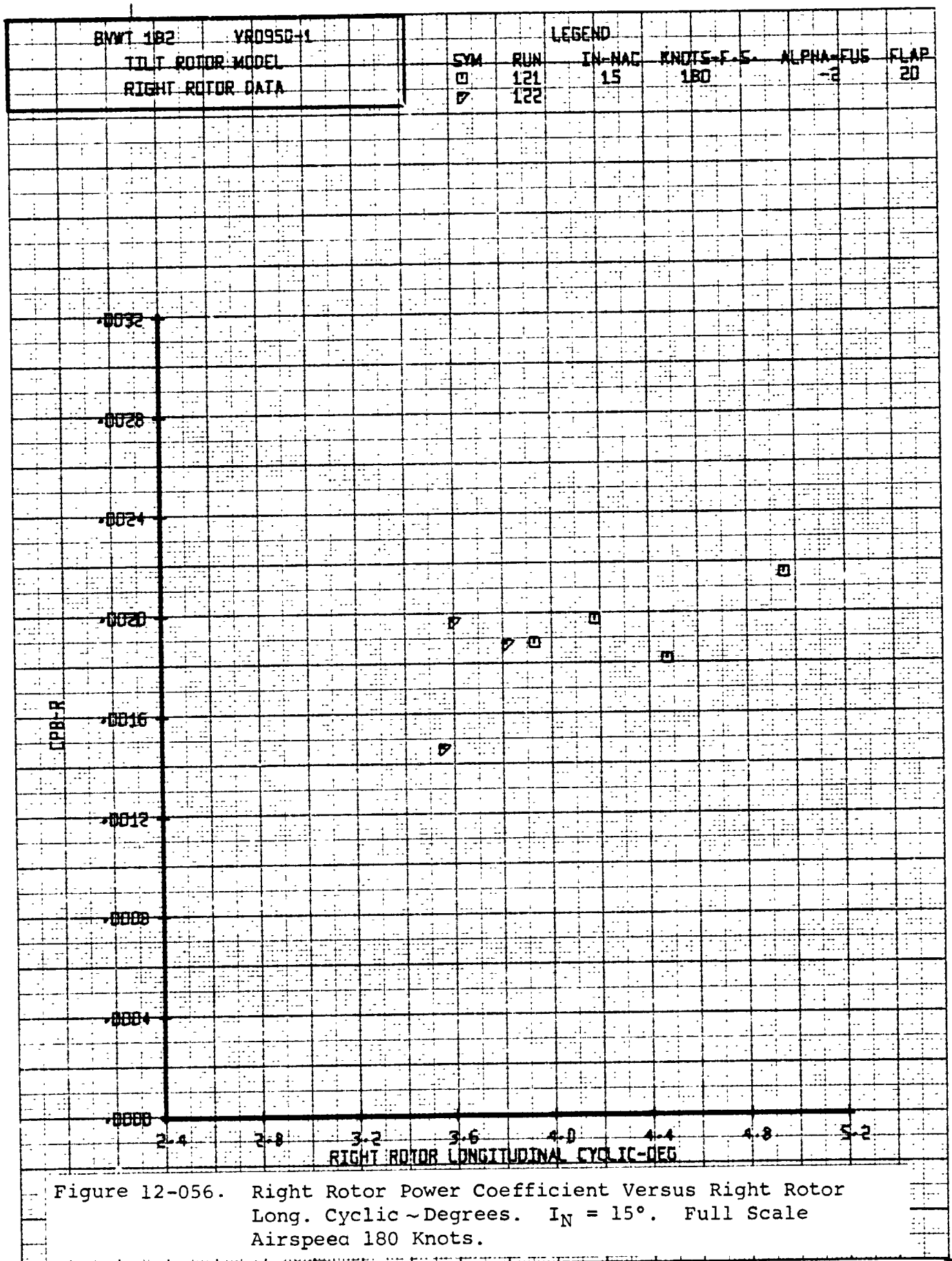


Figure 12-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeea 180 Knots.

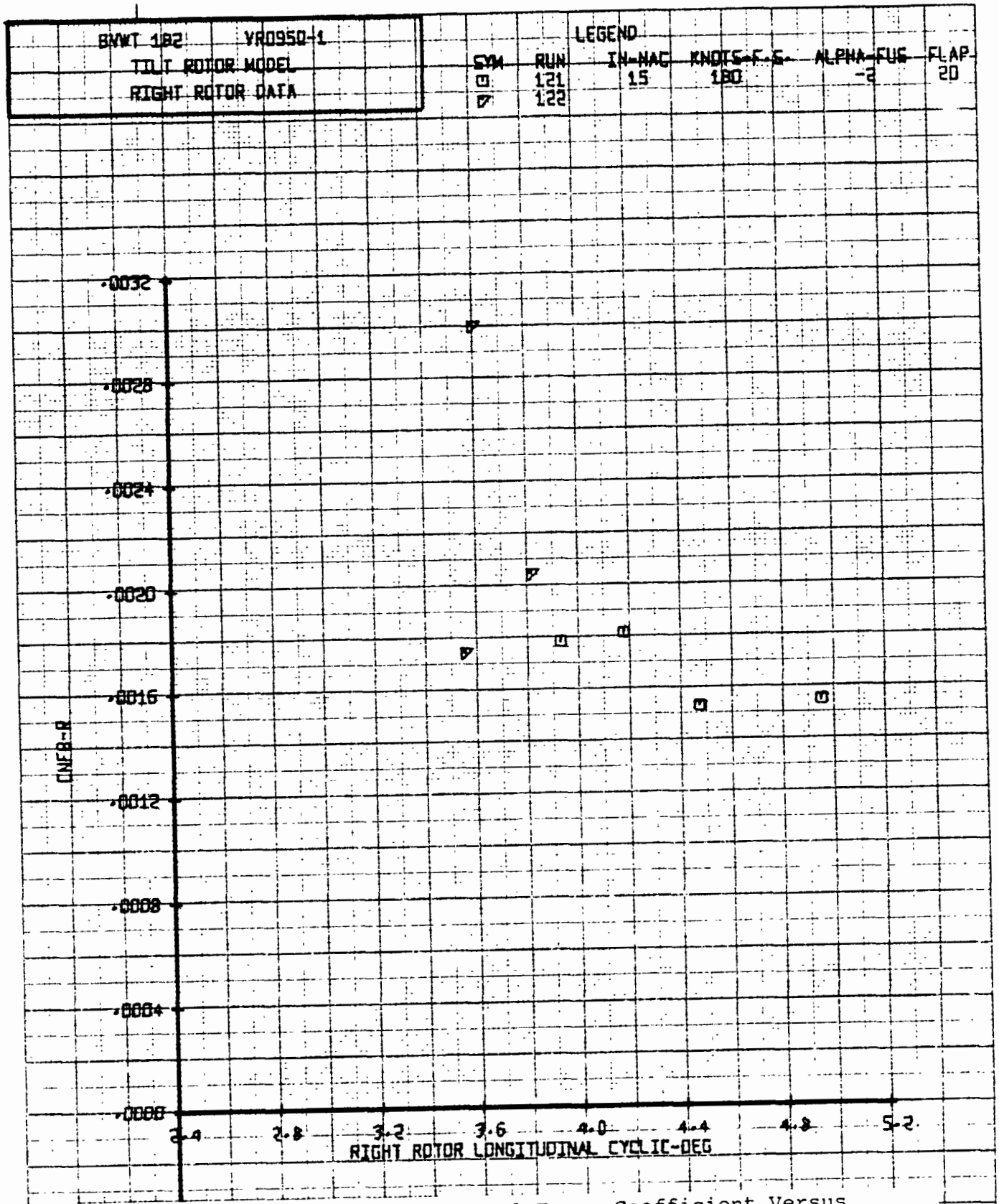


Figure 12-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

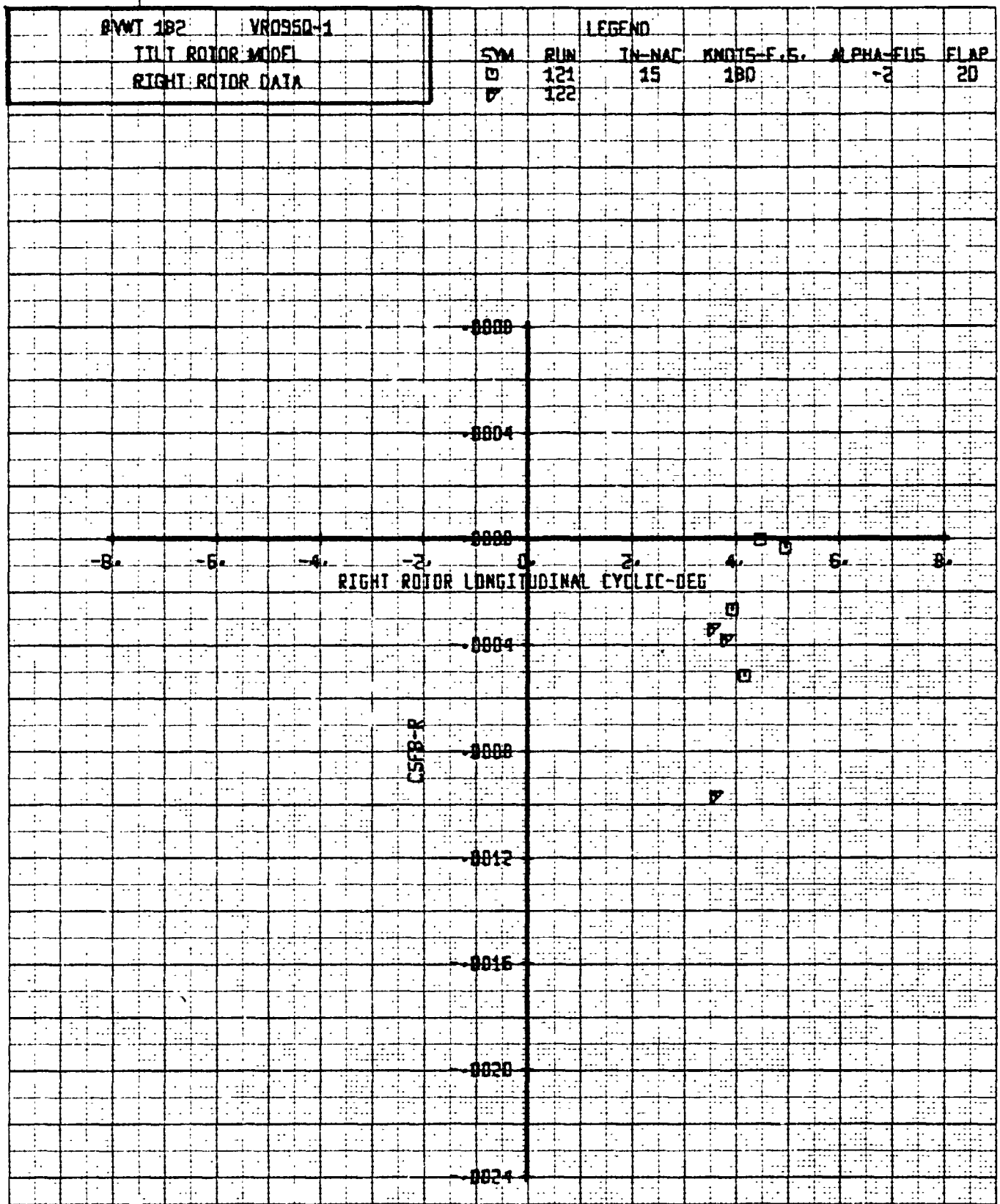


Figure 12-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

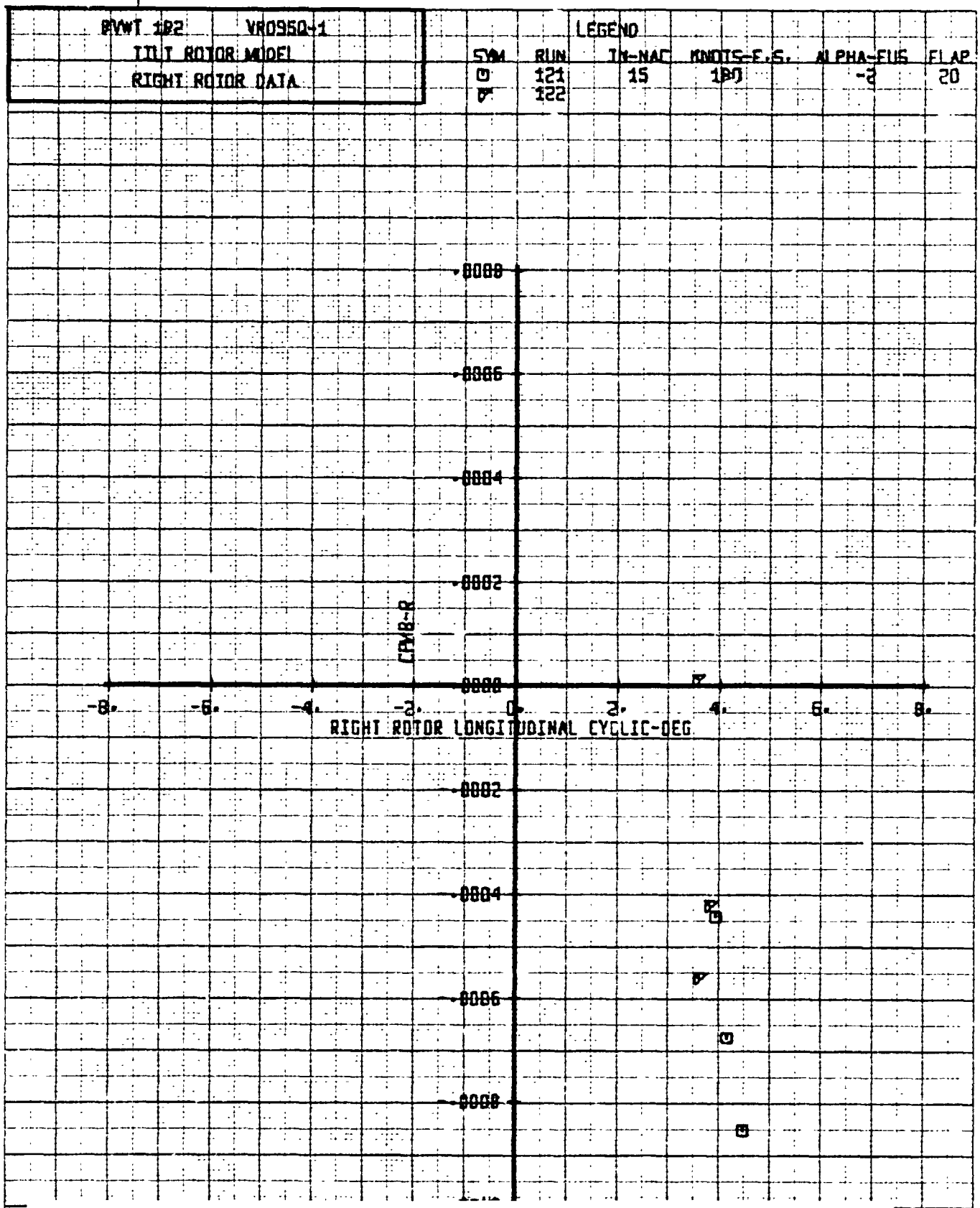


Figure 12-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

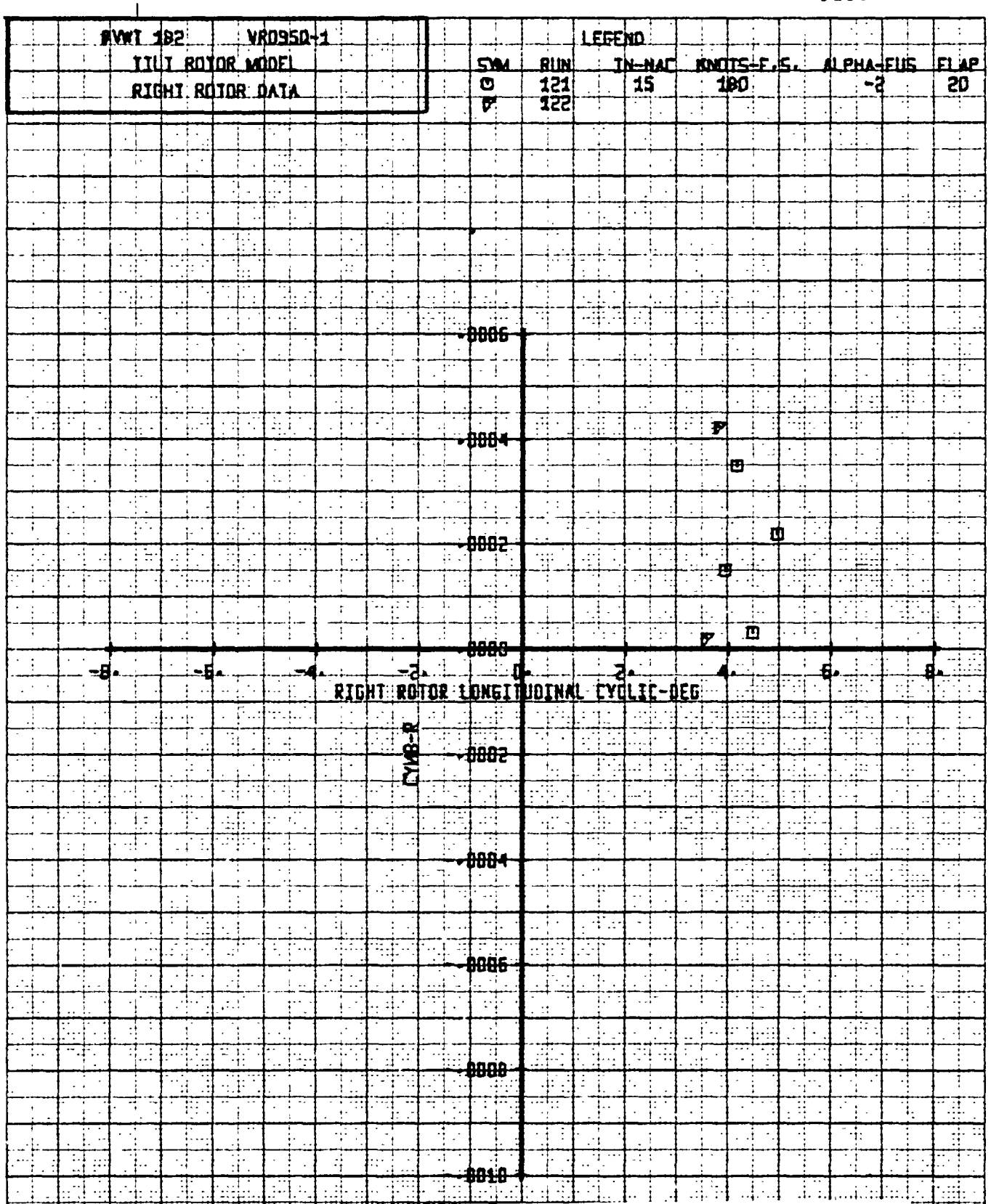
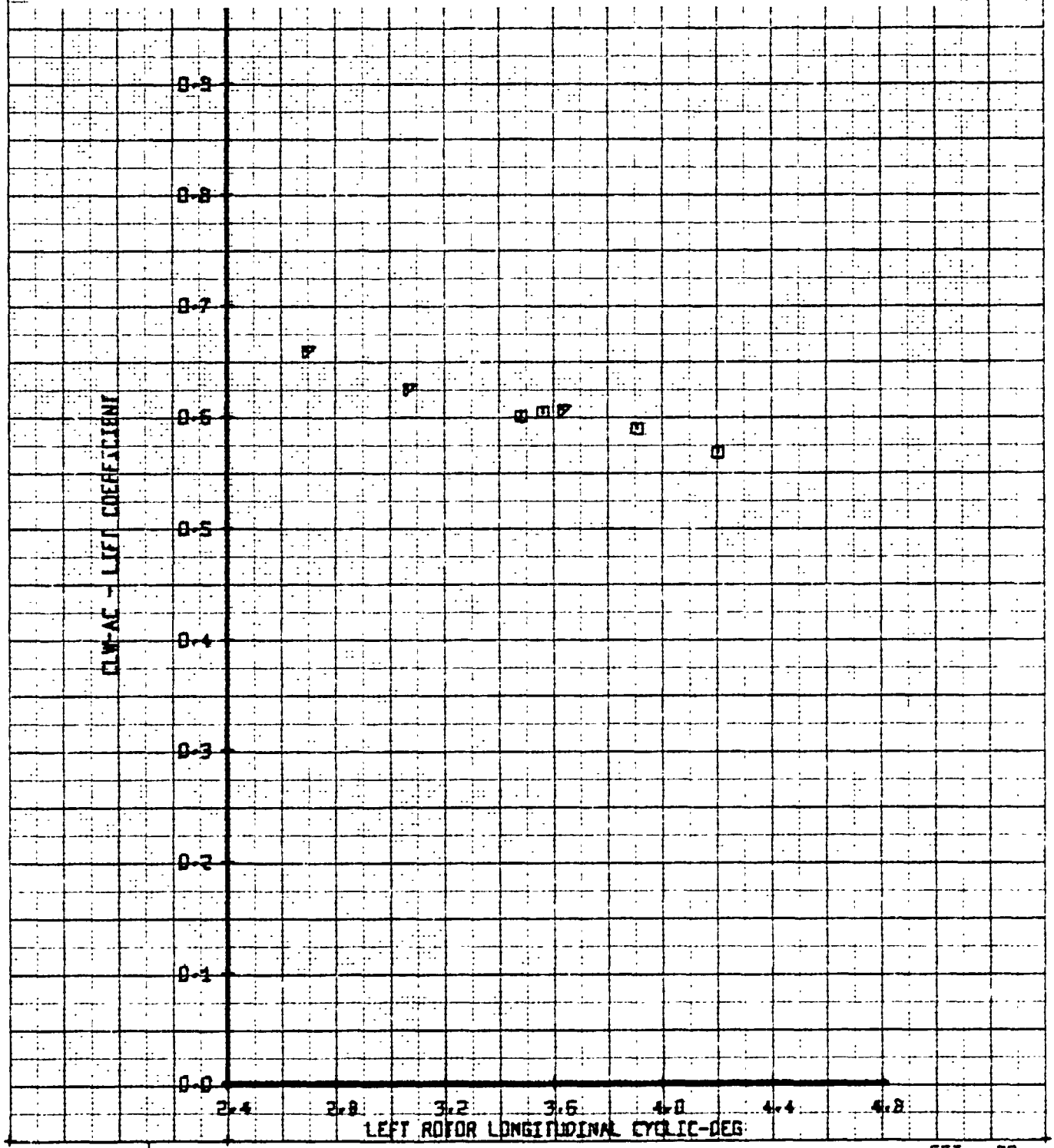


Figure 12-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	121	15	180	-2	20
▽	122	15	180	-2	20

Figure 12-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



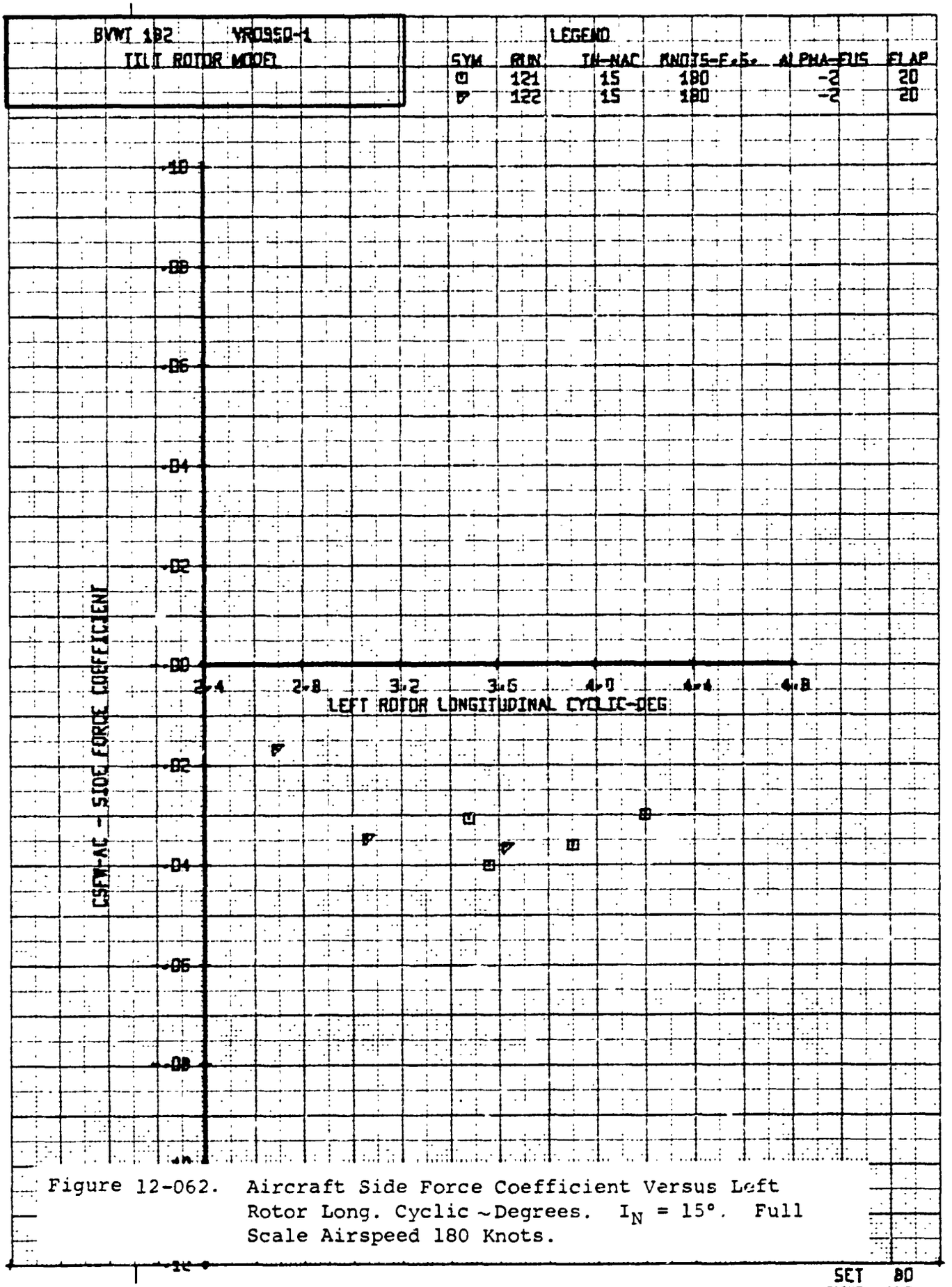


Figure 12-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

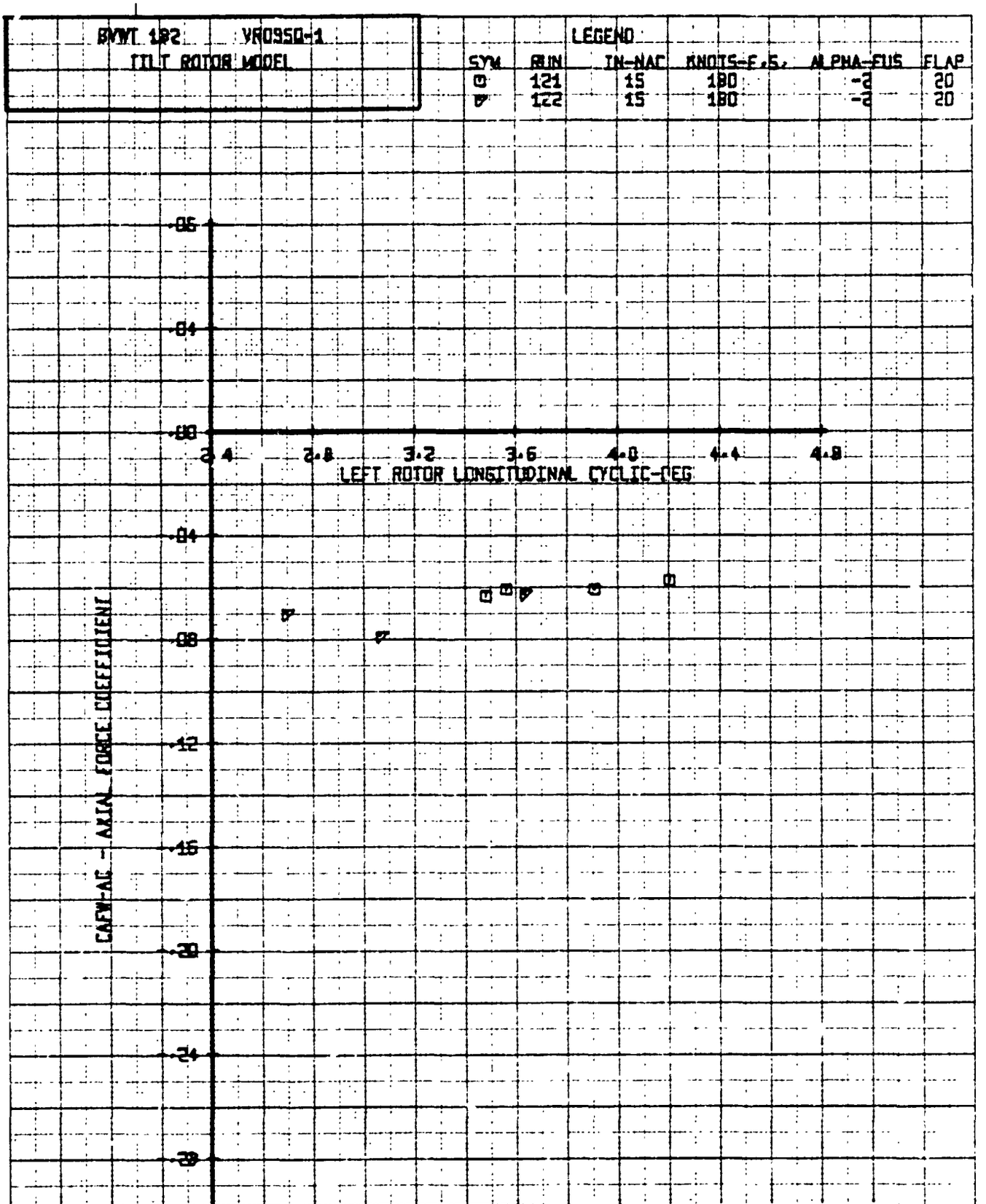


Figure 12-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic - Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

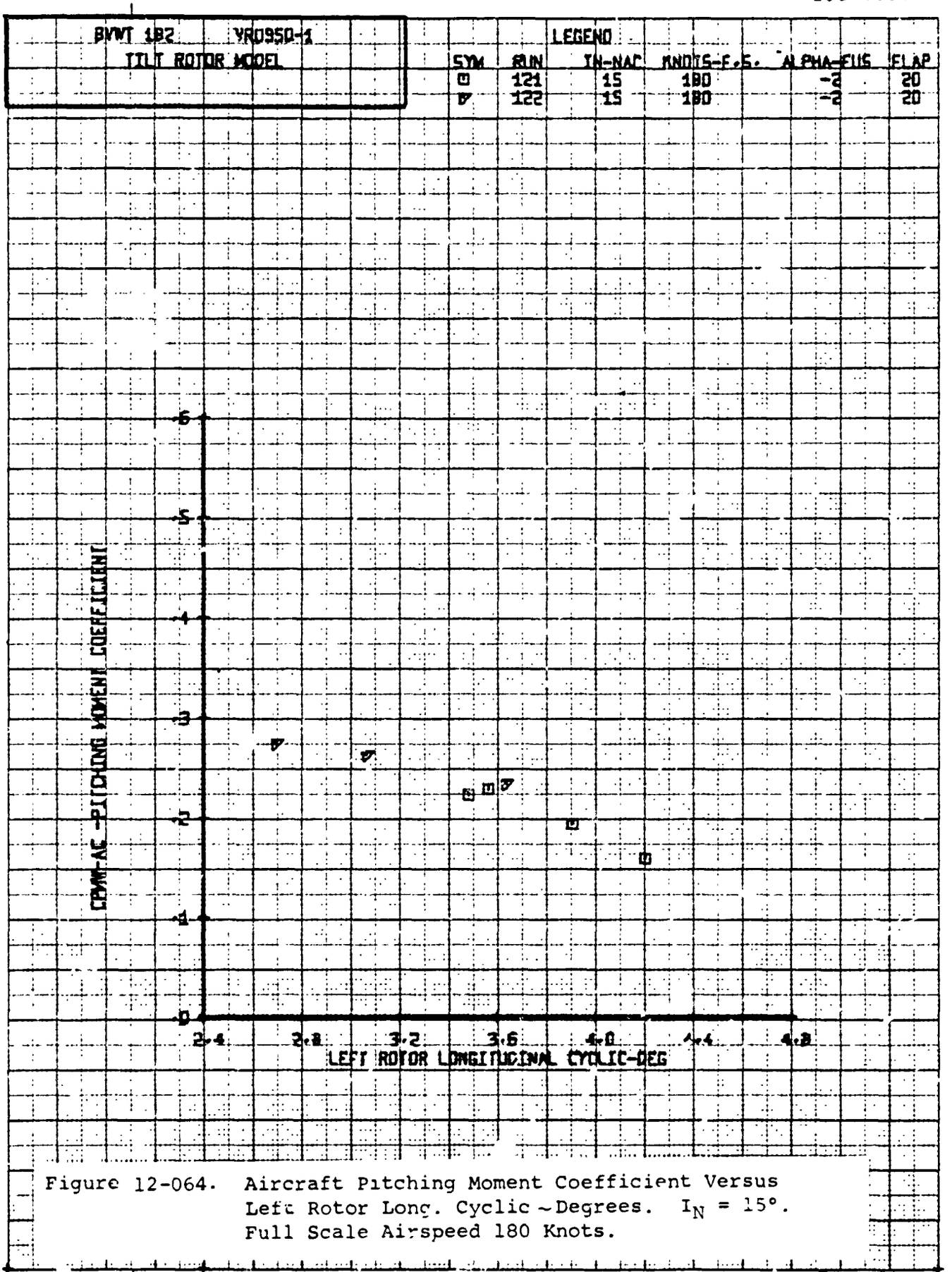


Figure 12-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

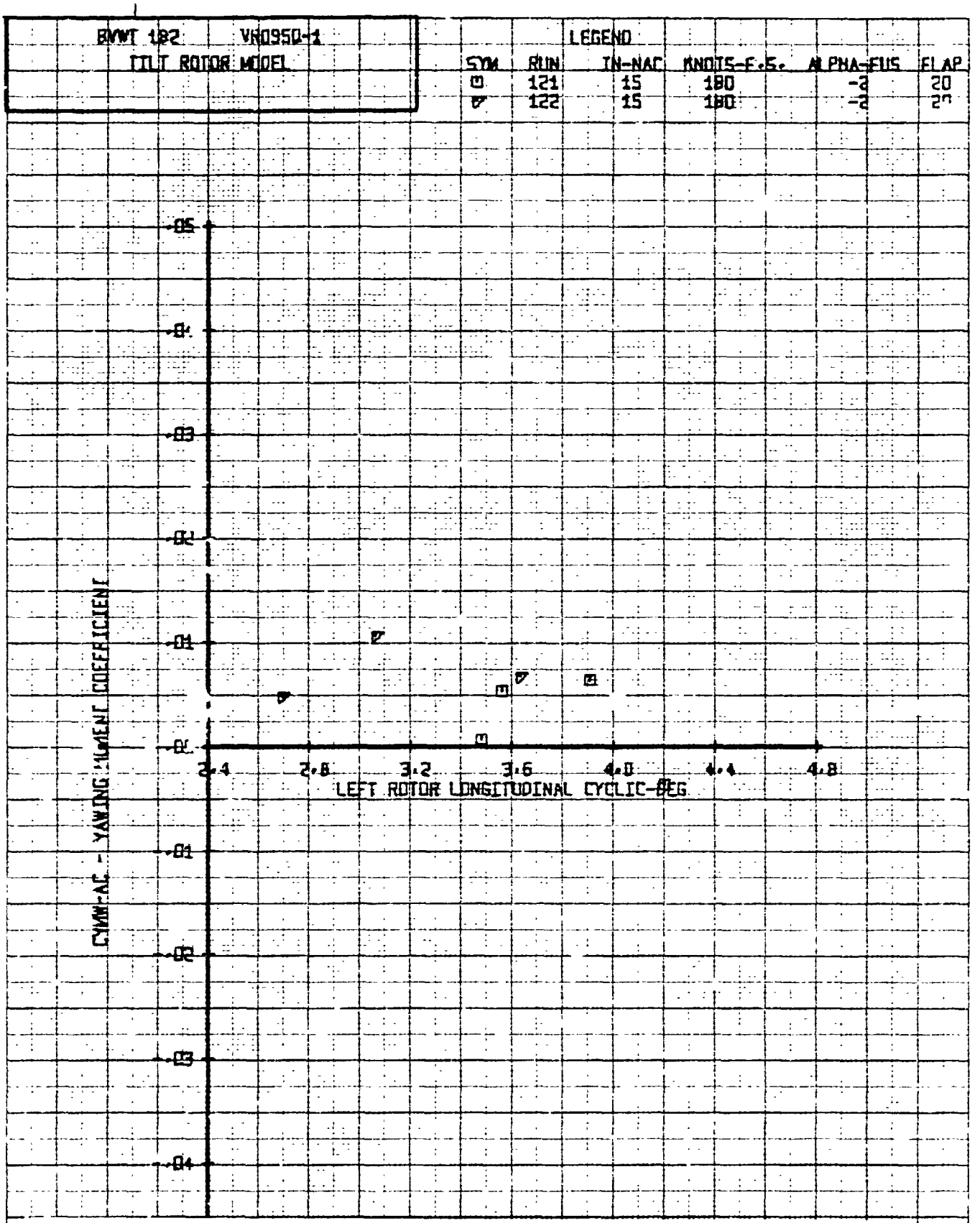


Figure 12-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

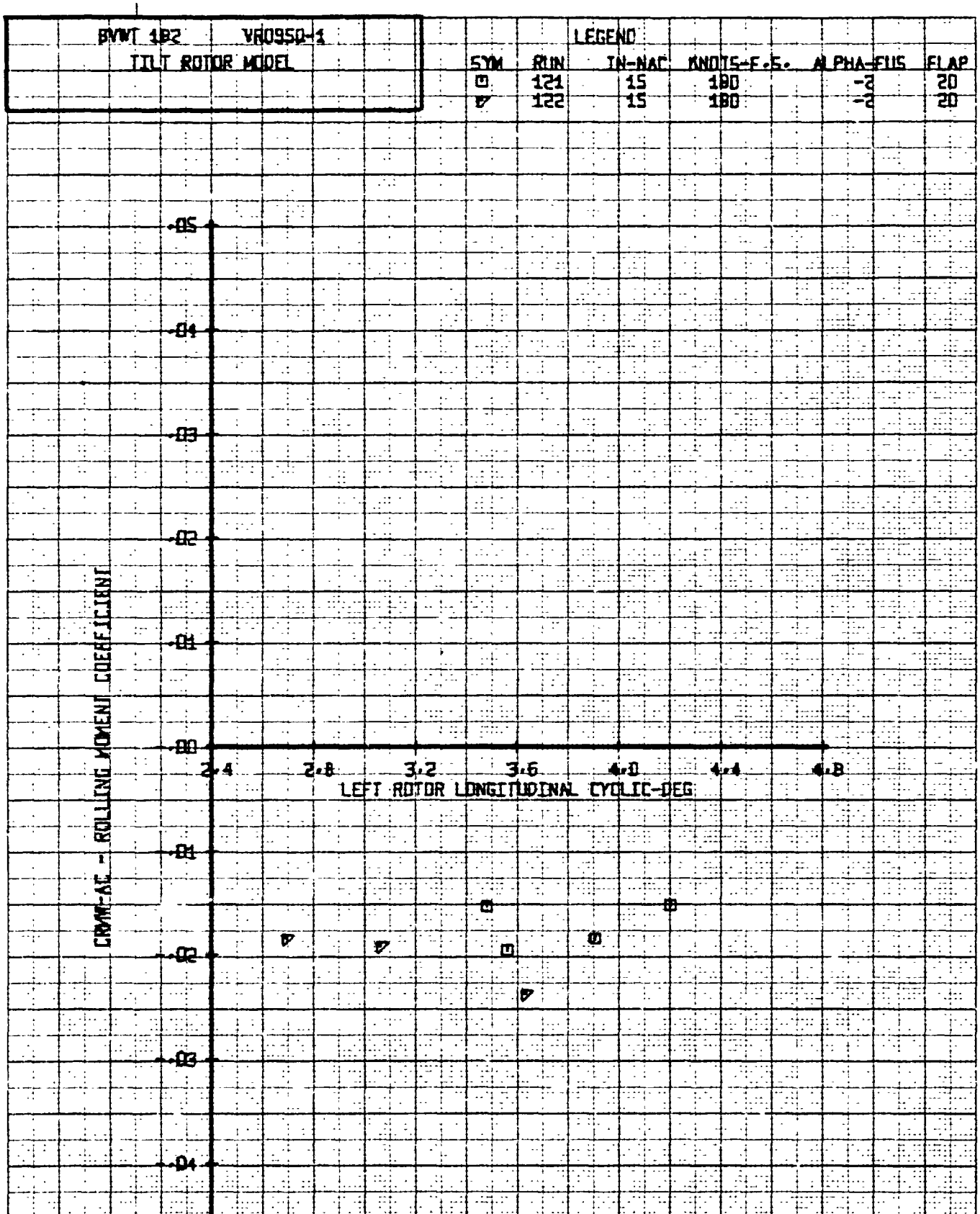


Figure 12-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

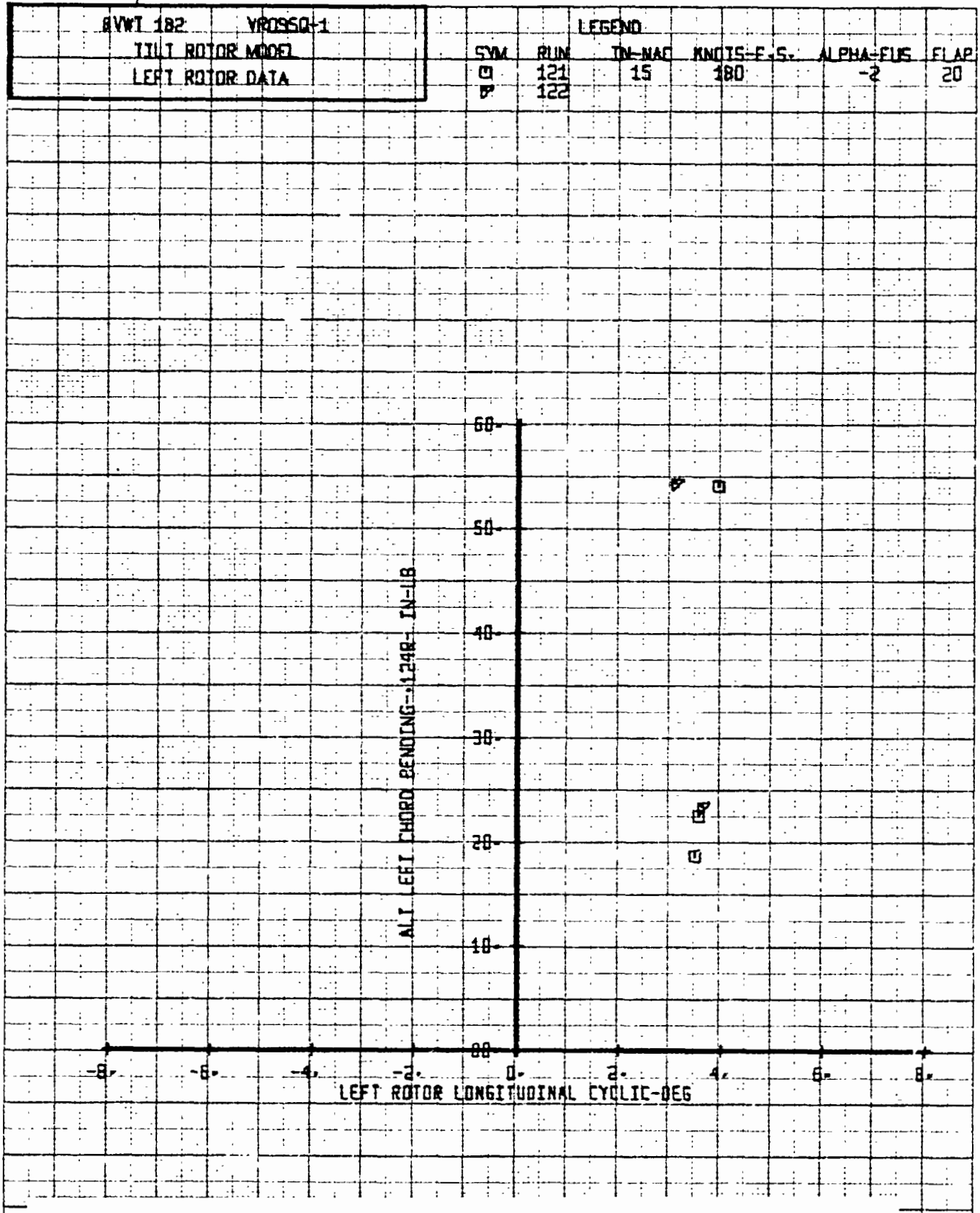


Figure 12-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic - Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

SET 80
BVWT 182

SET 80
BVWT 182

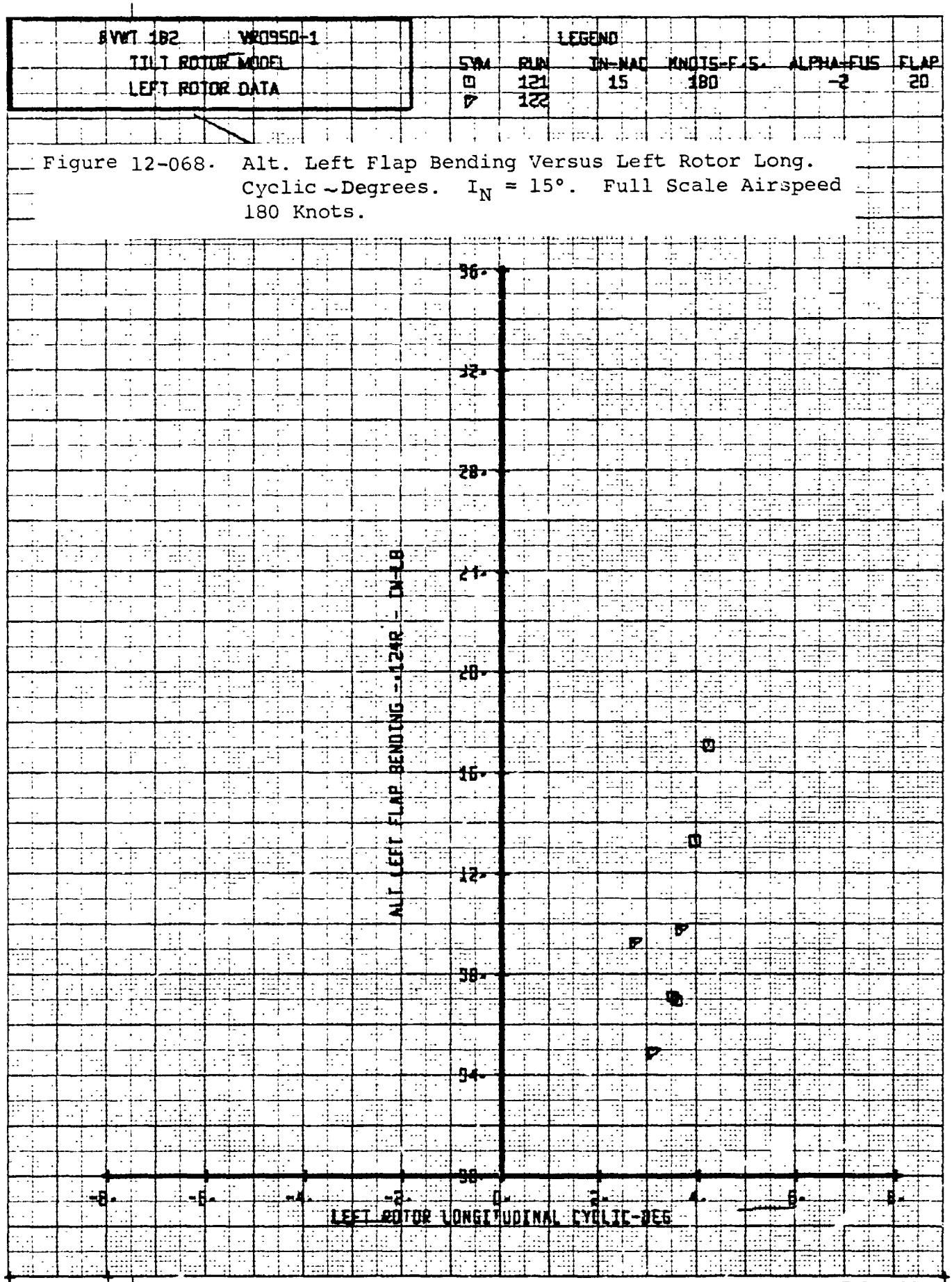


Figure 12-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

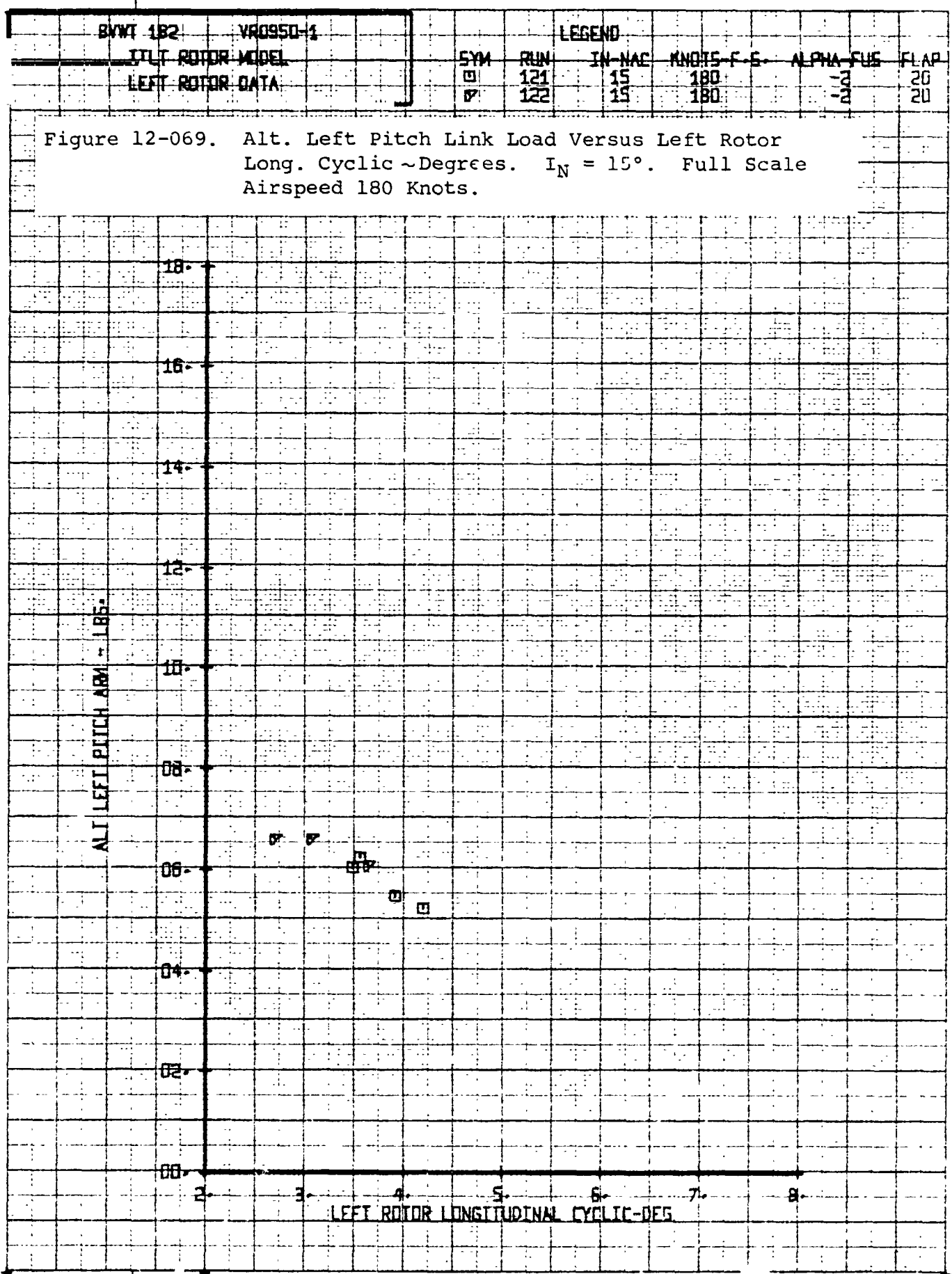


Figure 12-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

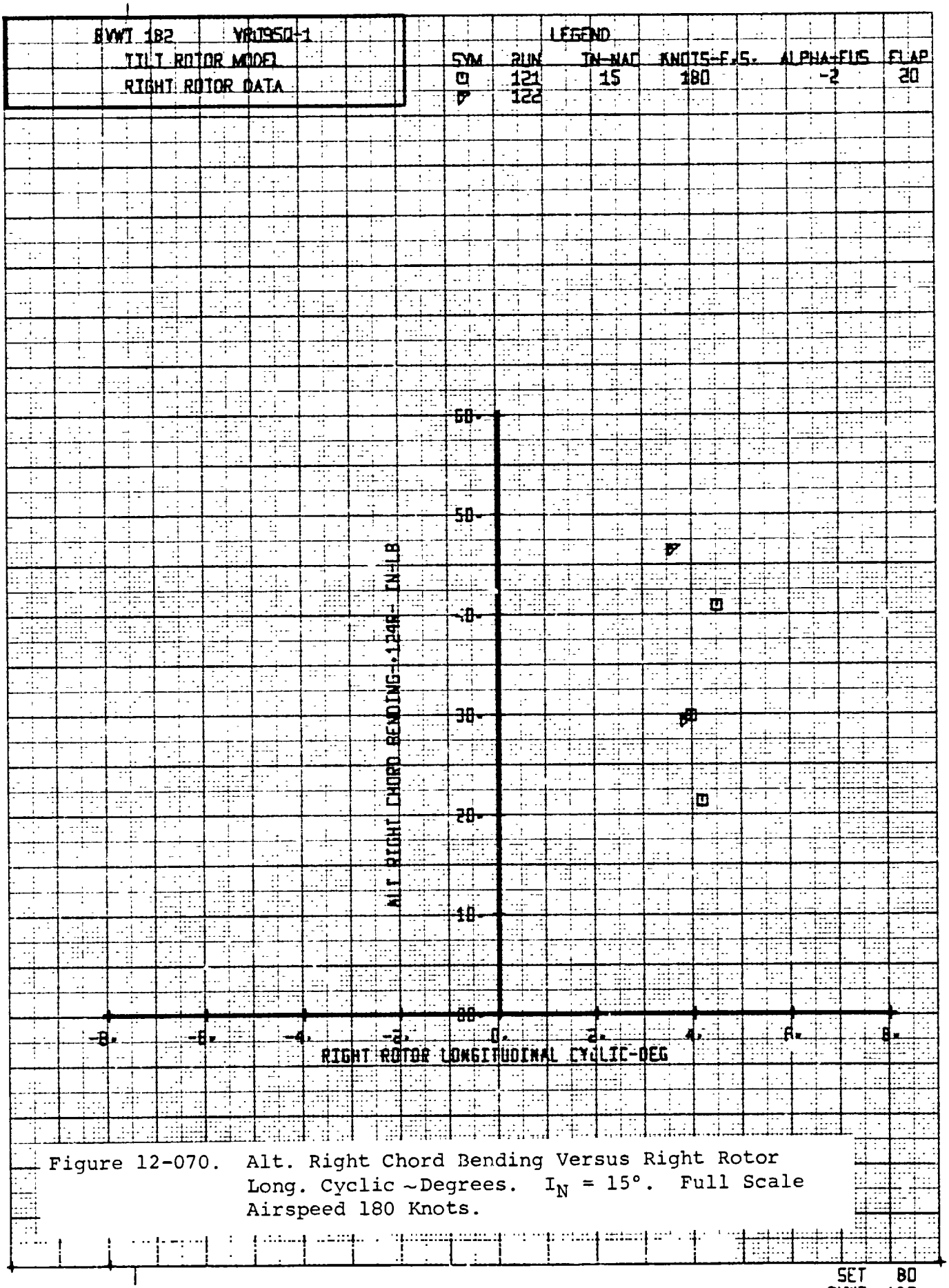


Figure 12-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

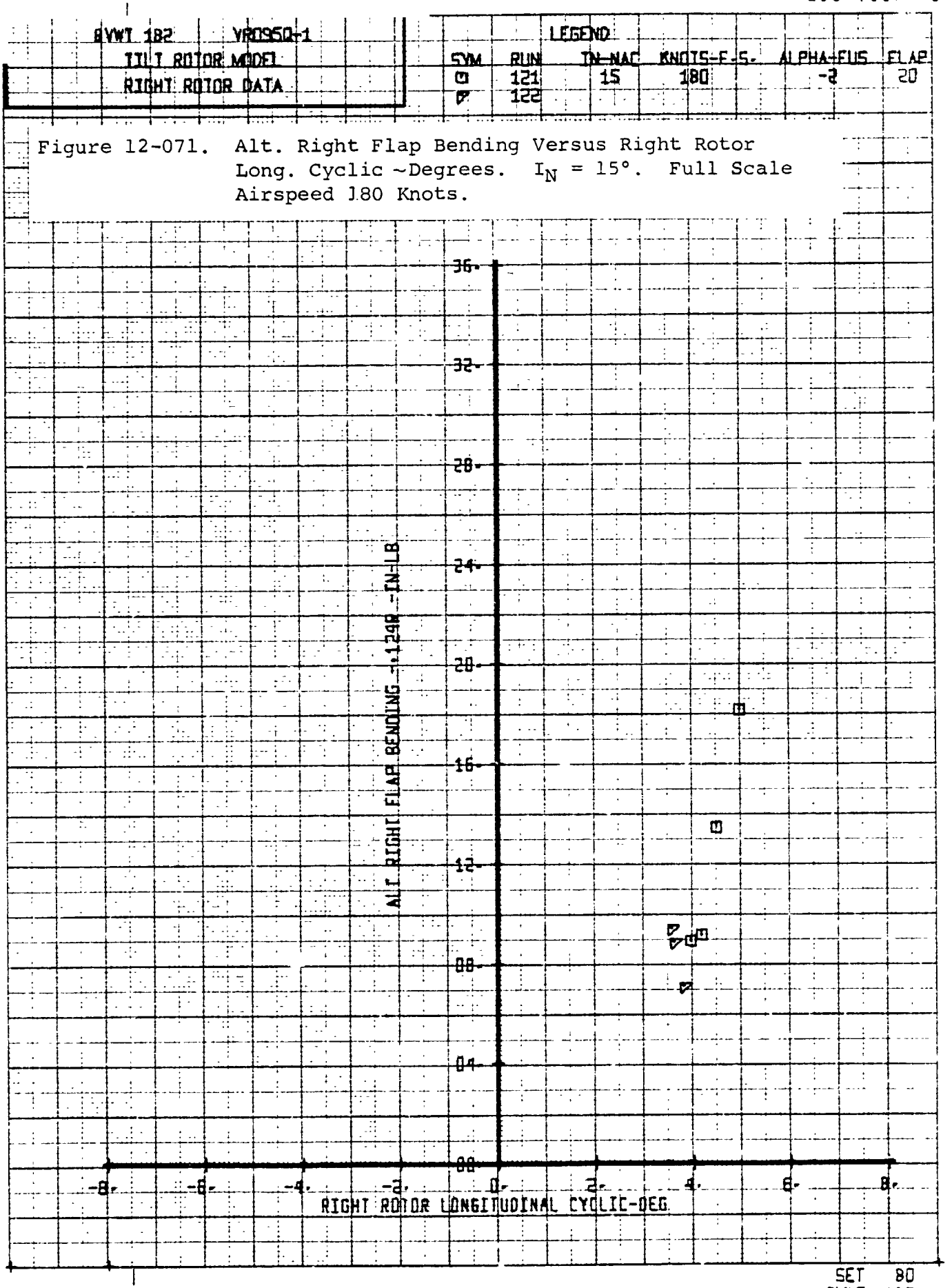


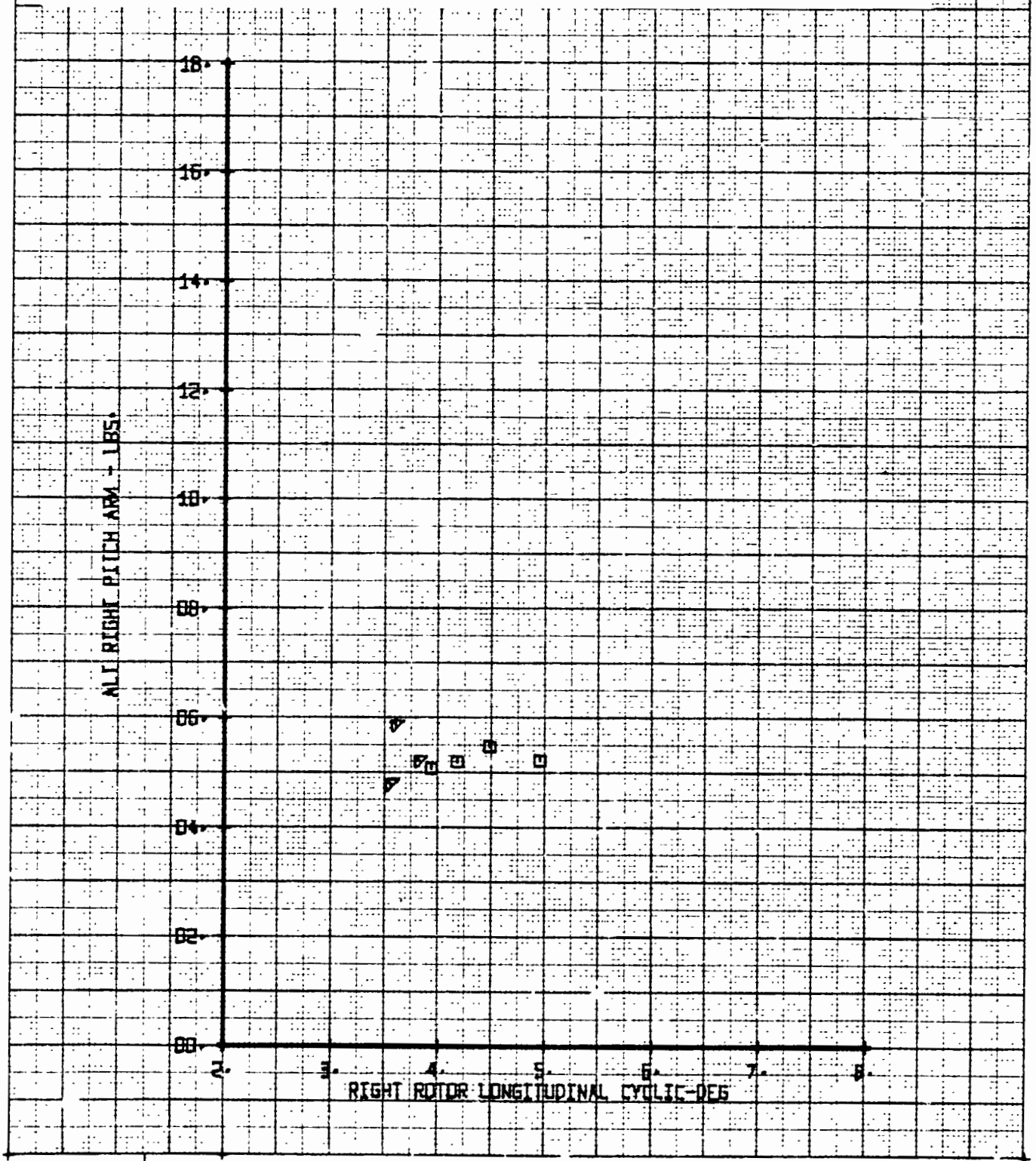
Figure 12-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

BWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	121	15	180	-2	20
▽	122	15	180	-2	20

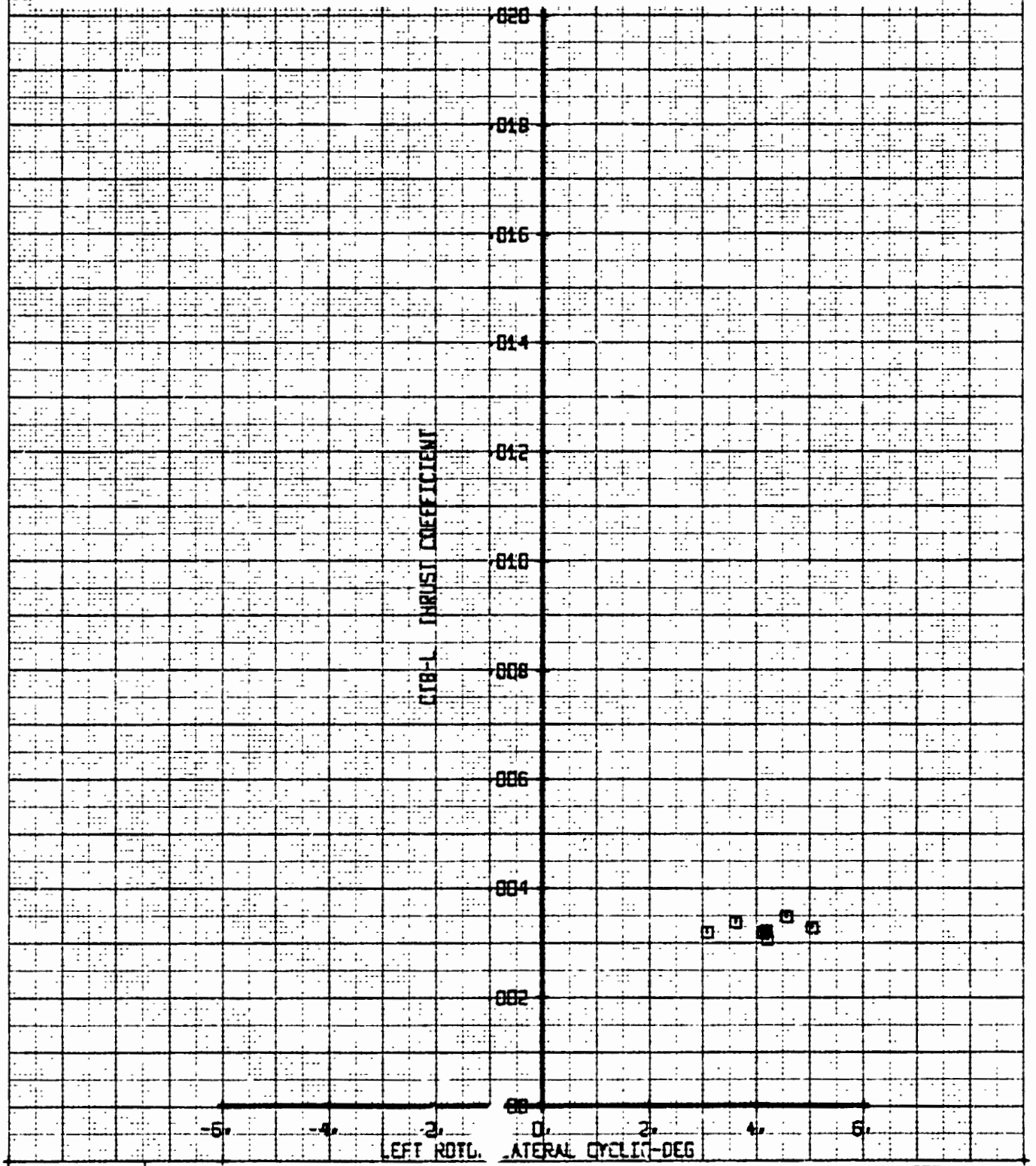
Figure 12-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	120	15	180	-2	20

Figure 12-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



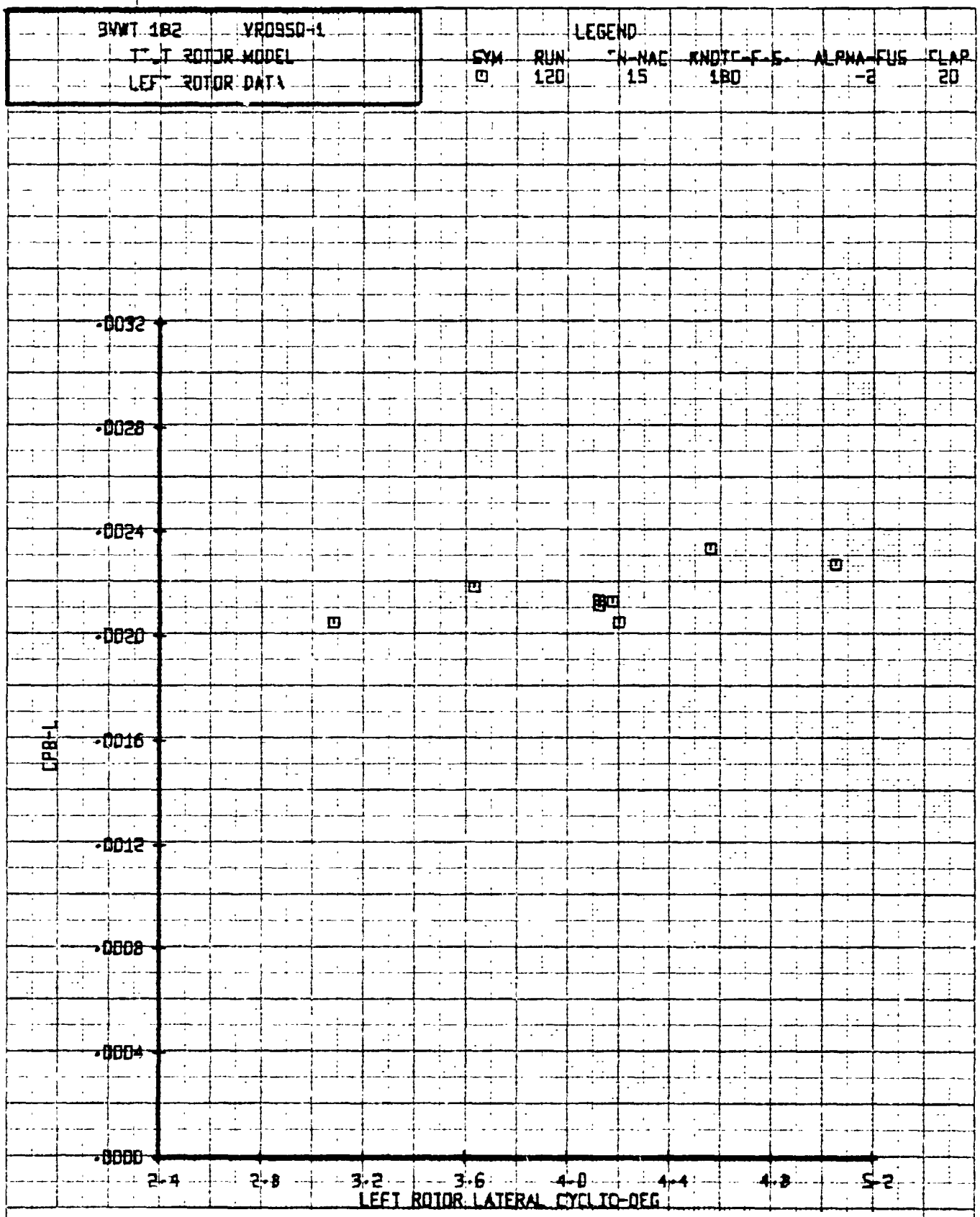


Figure 12-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

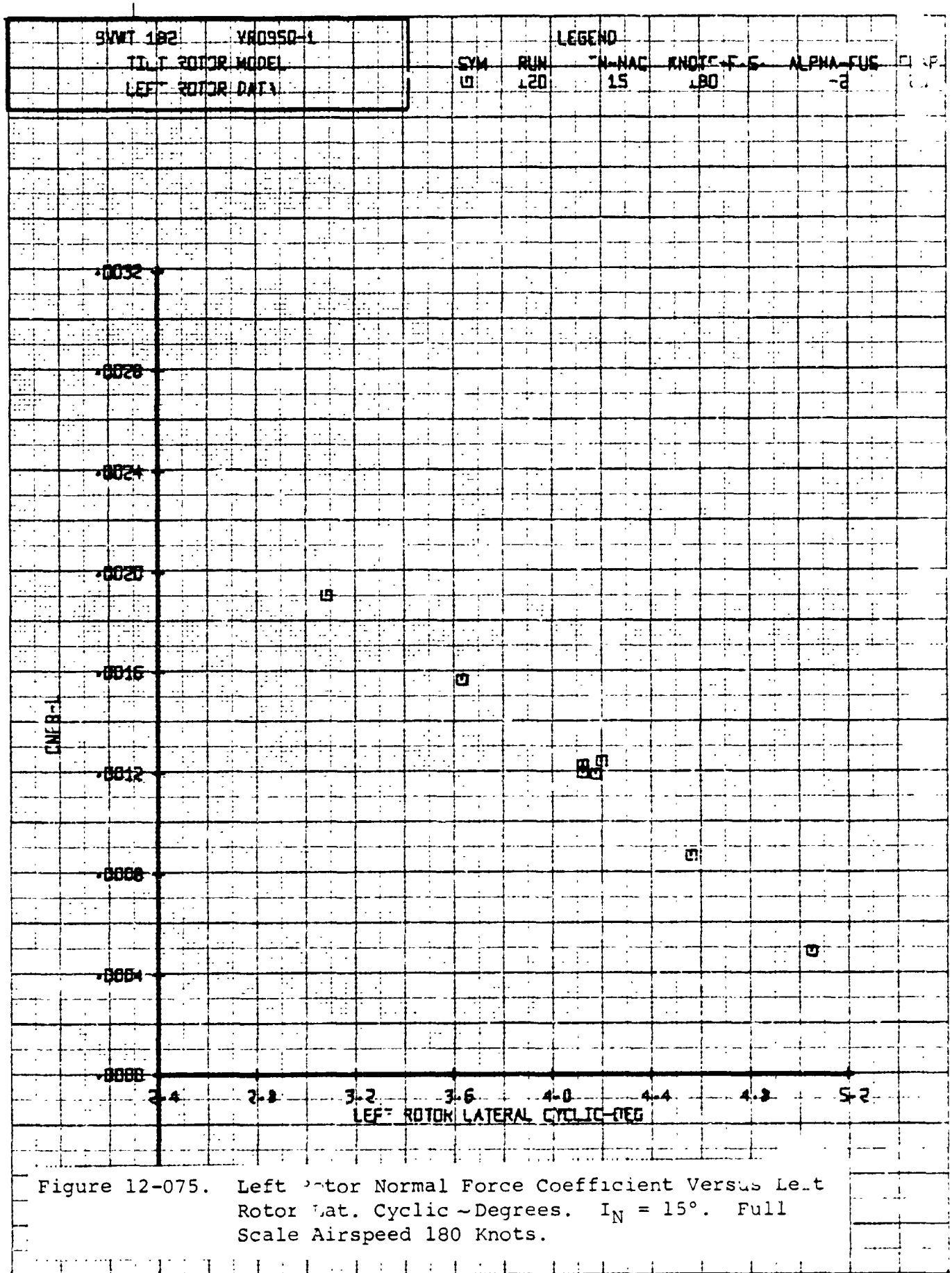


Figure 12-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

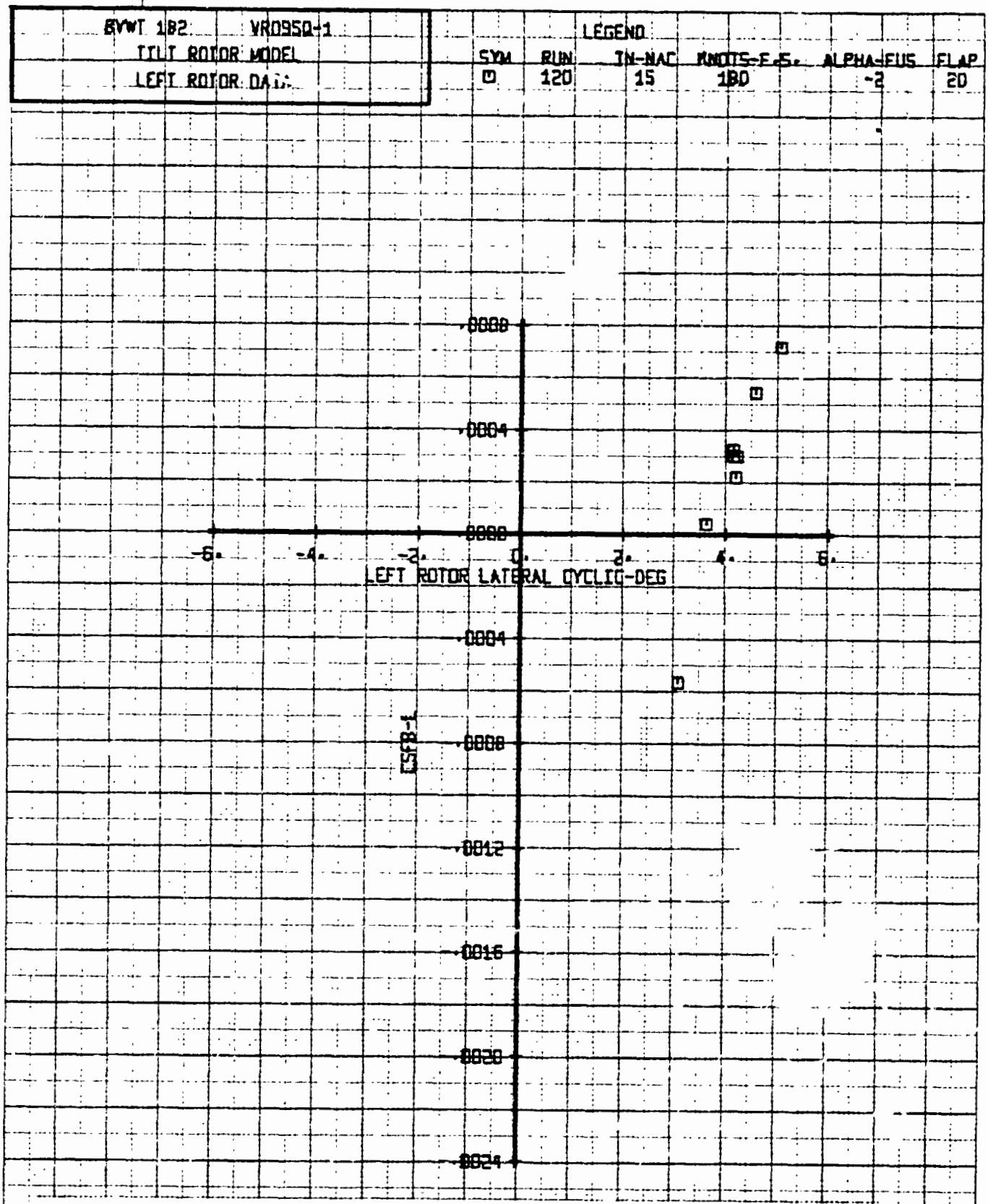
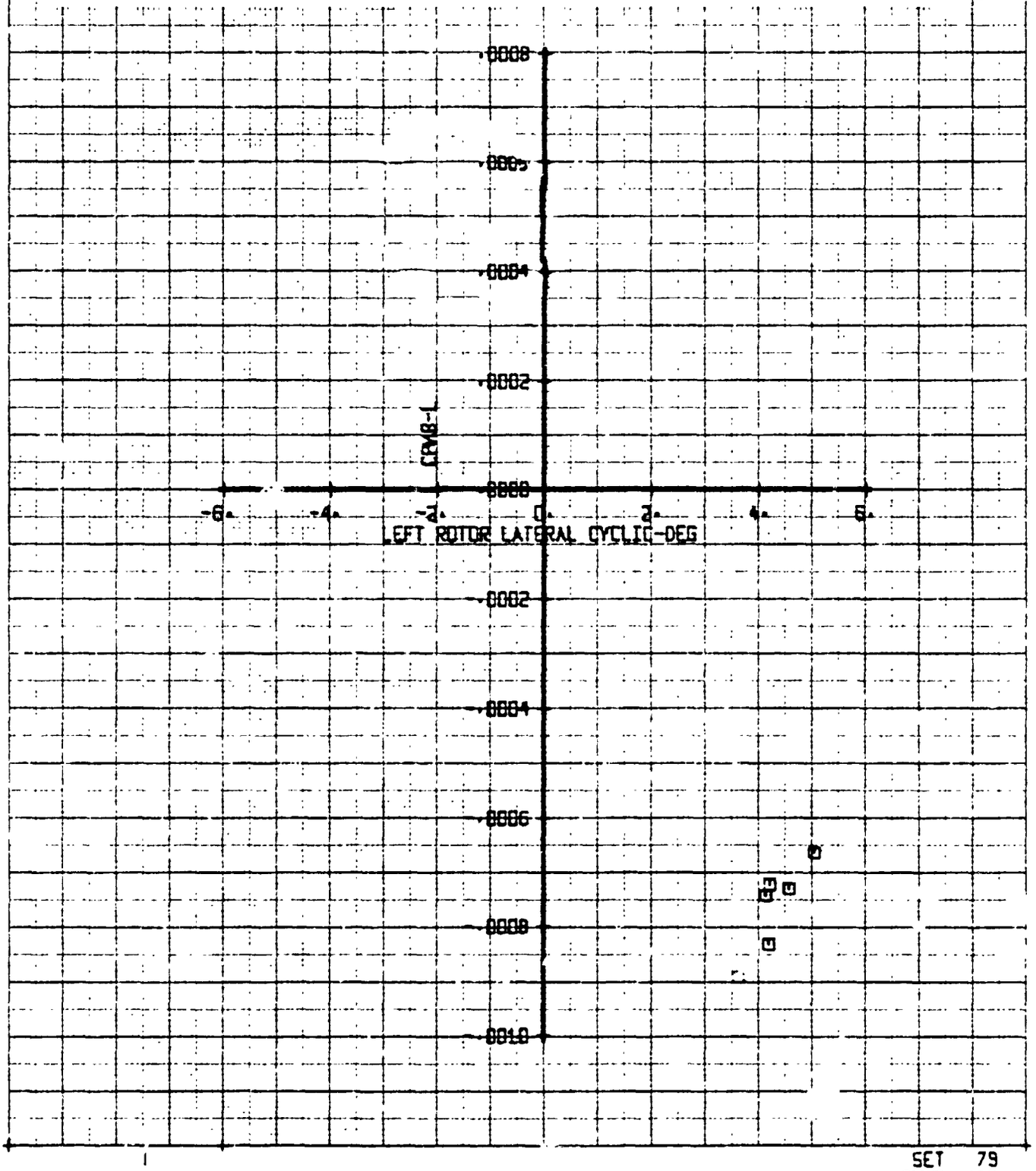


Figure 12-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VROTSD-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND SYM	RUN	IN-NAC	KNOTS-FS	ALPHA-FUS	E AP
⊡	120	15	180	-2	20

Figure 12-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.



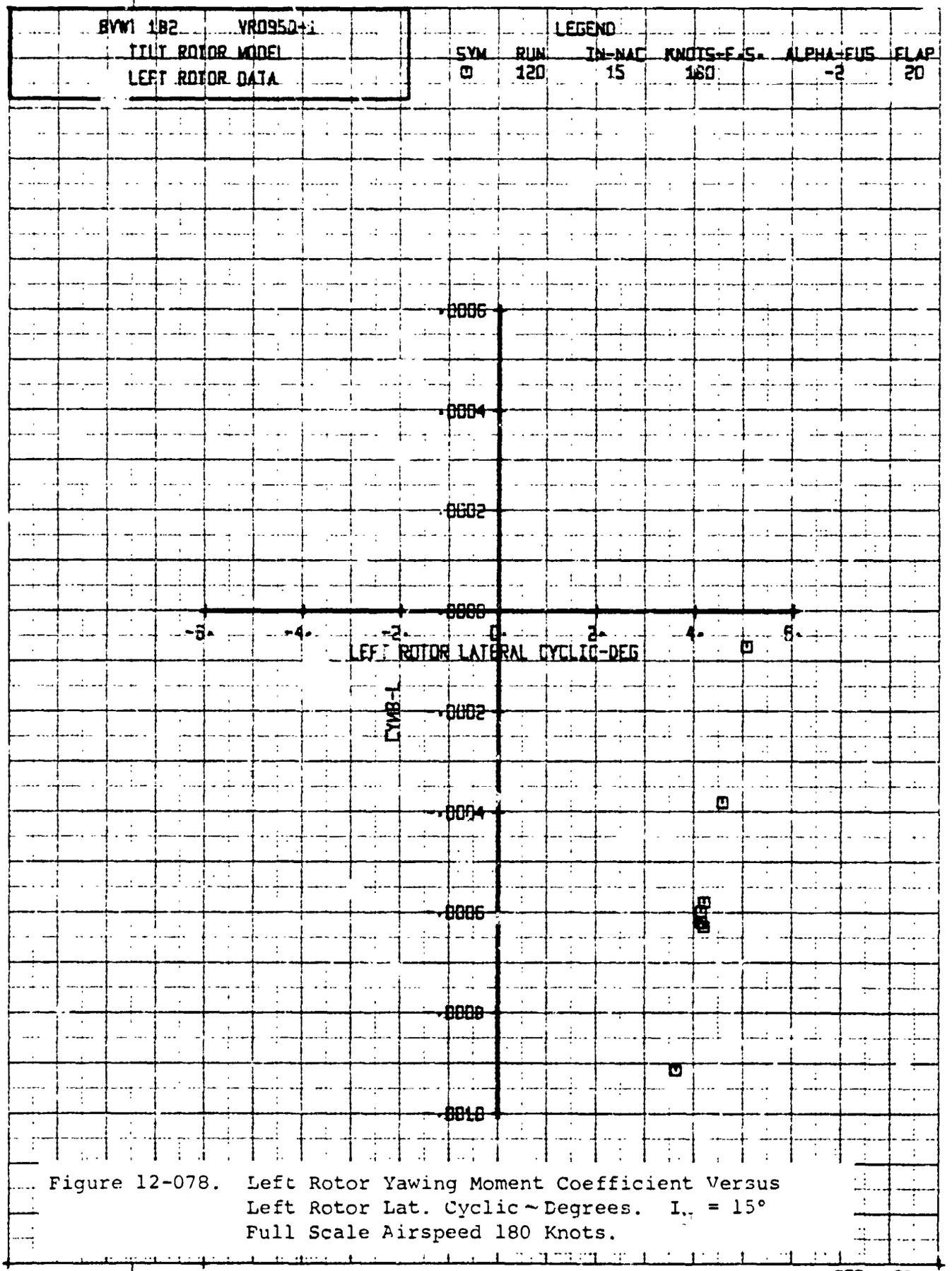


Figure 12-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. I_{LR} = 15° Full Scale Airspeed 180 Knots.

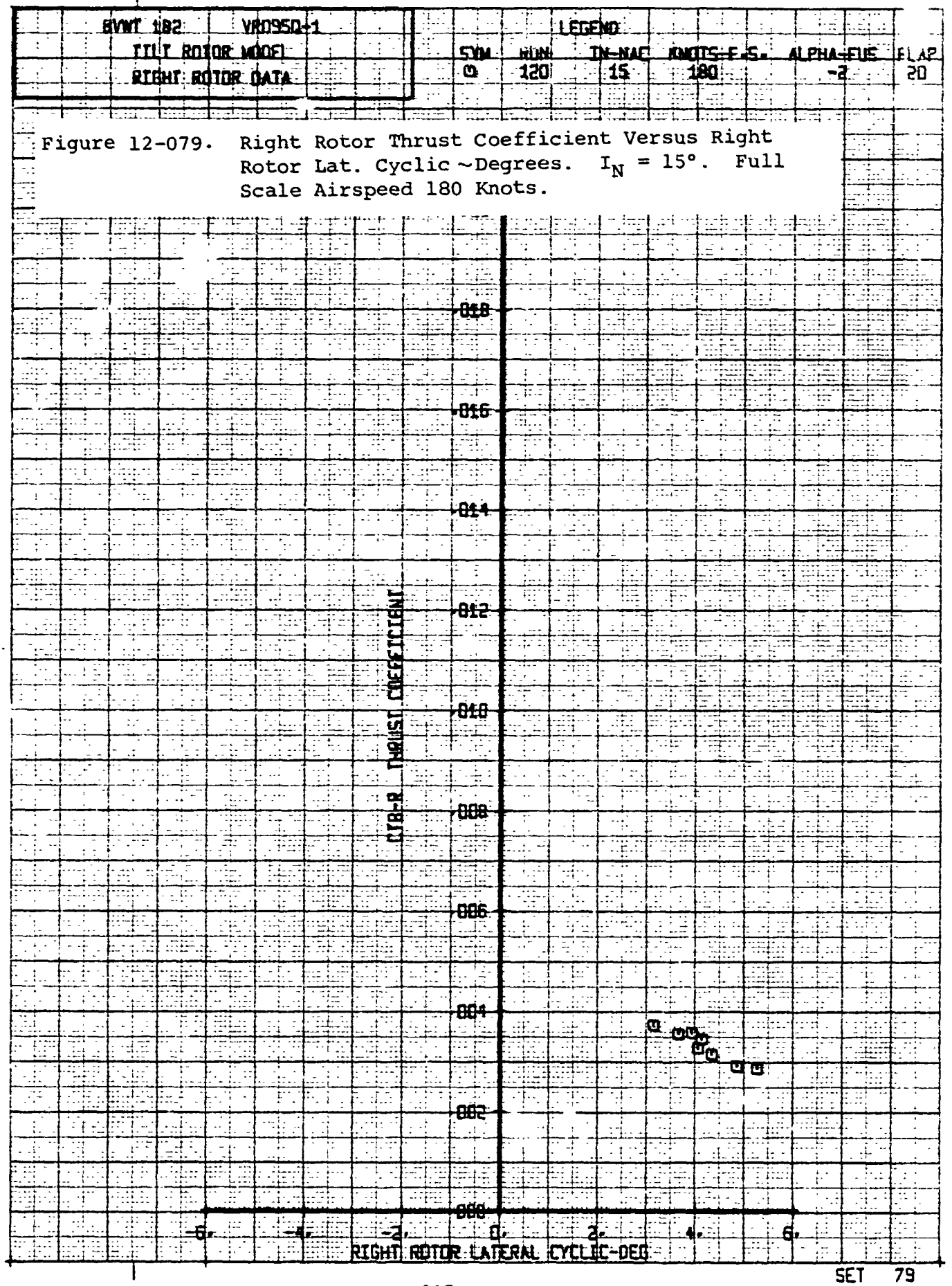


Figure 12-079. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

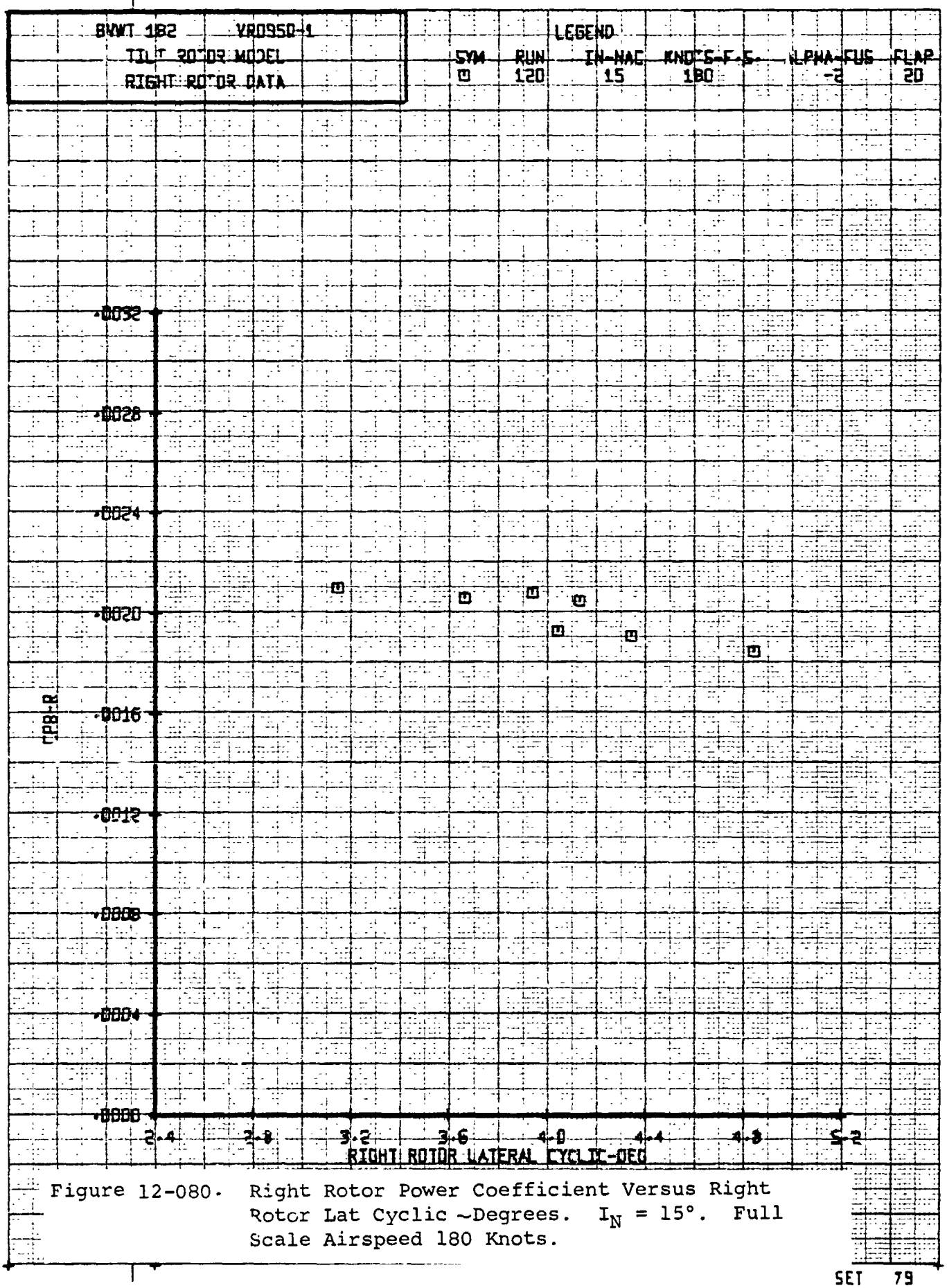


Figure 12-080. Right Rotor Power Coefficient Versus Right Rotor Lat Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

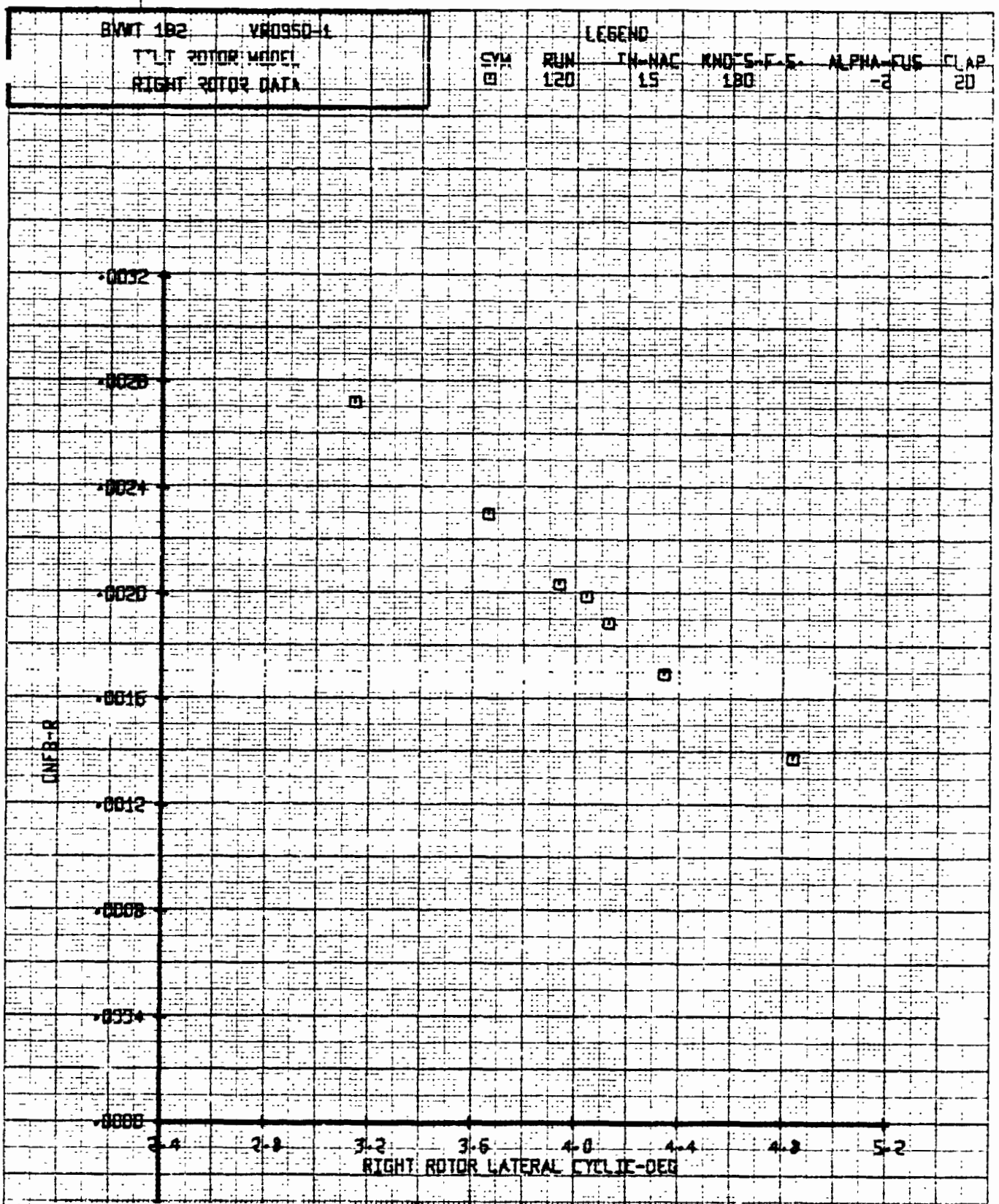


Figure 12-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

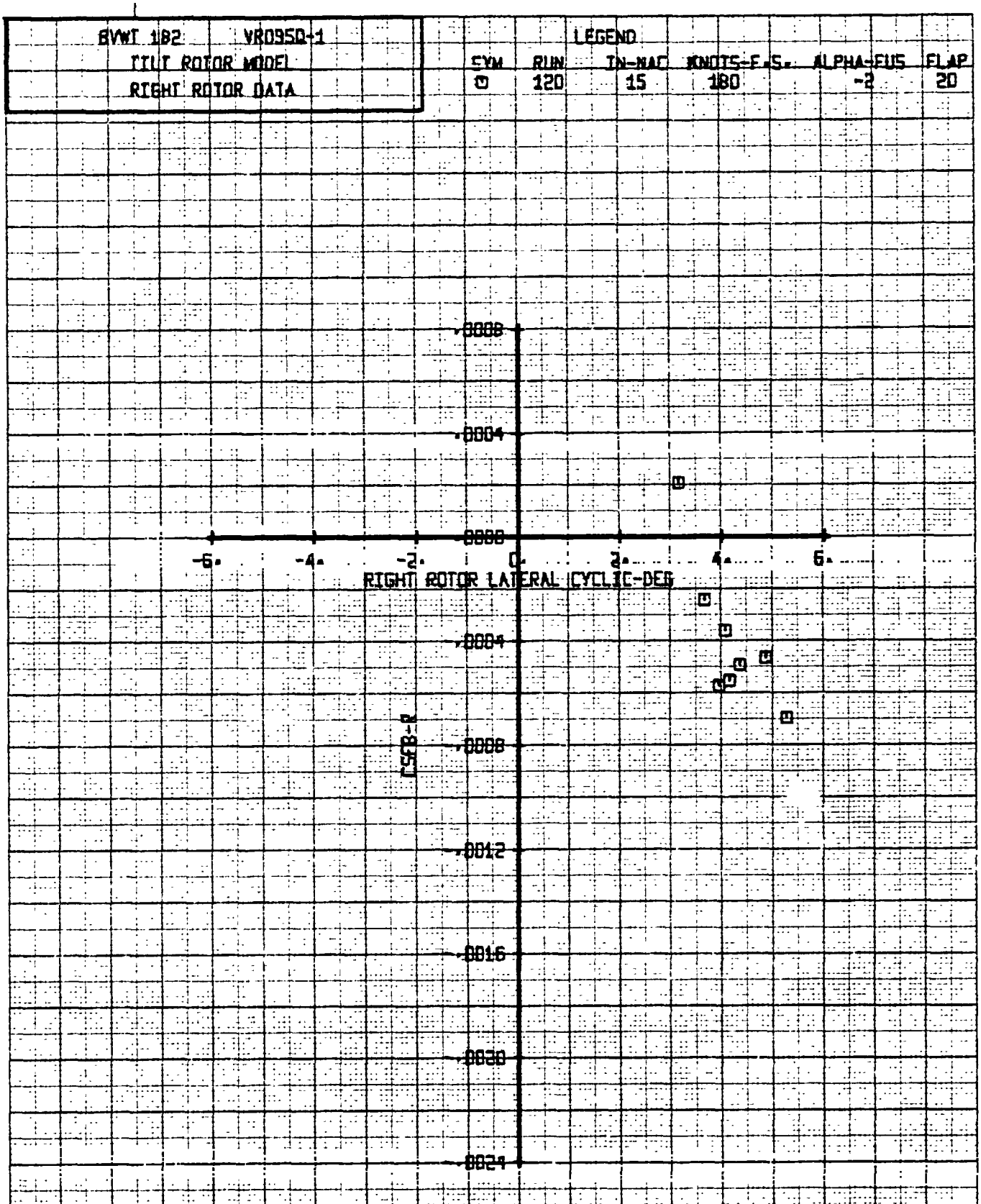


Figure 12-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

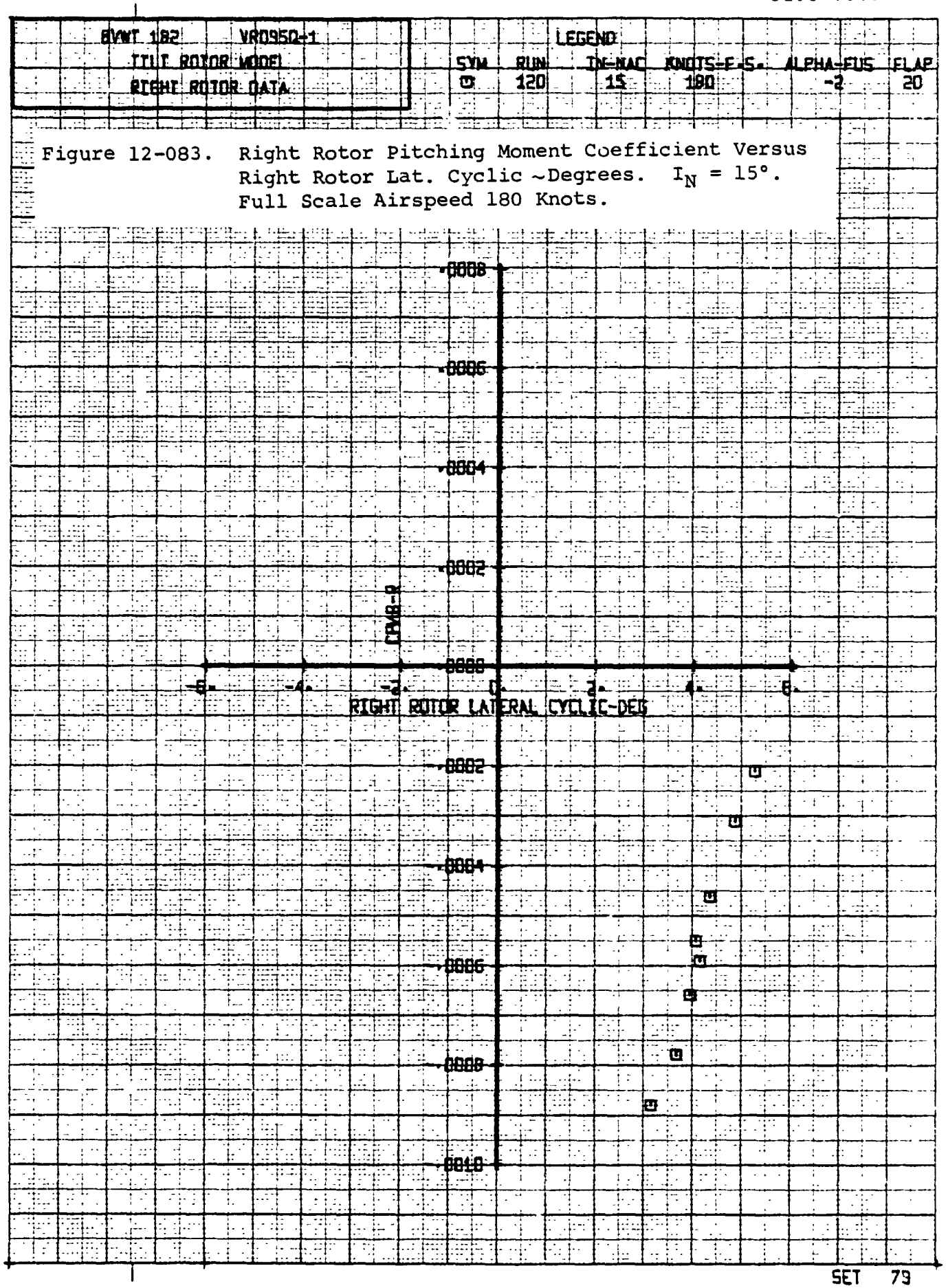


Figure 12-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

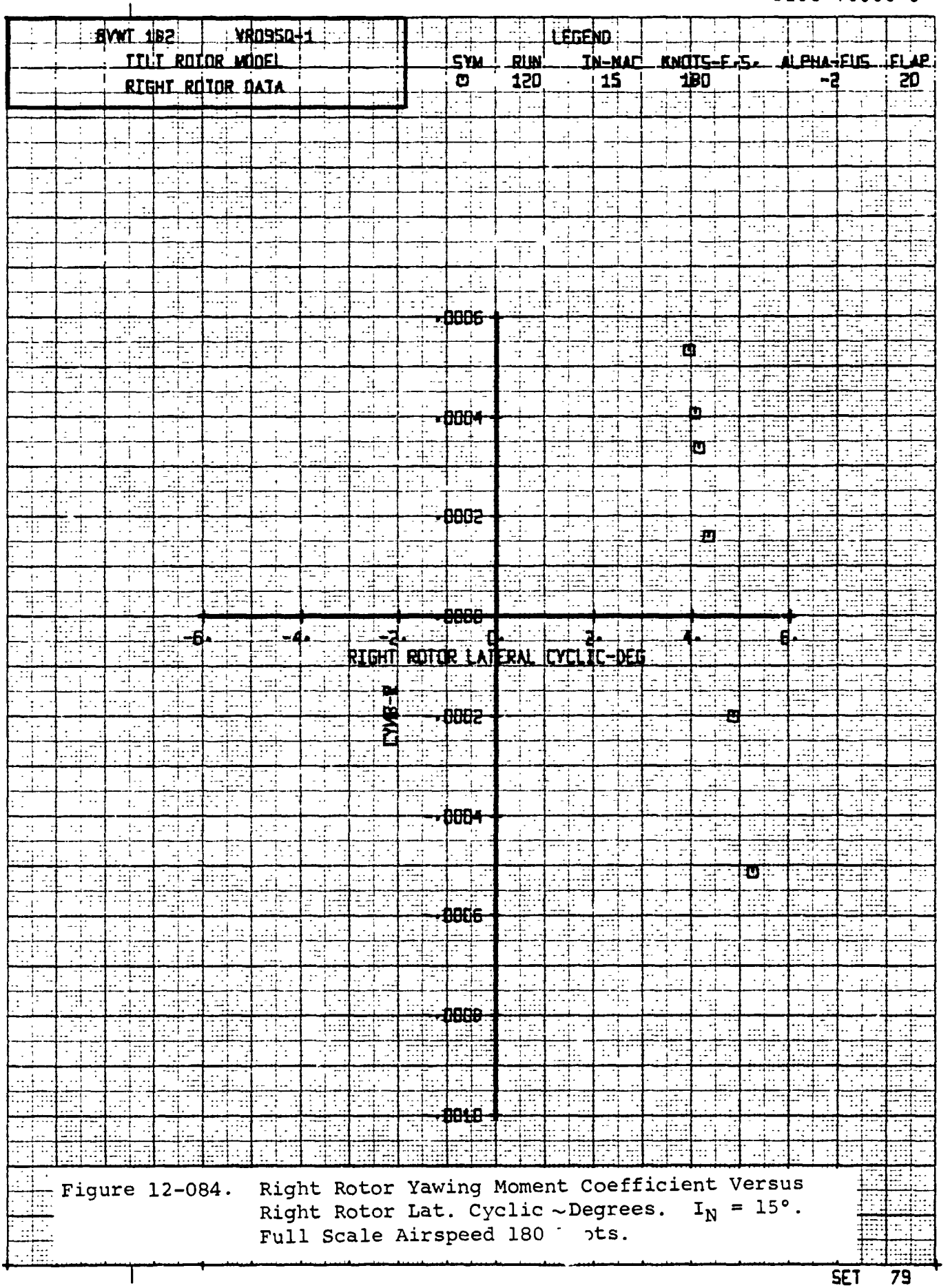


Figure 12-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 knots.

79
182

SET 79
BVWT 182

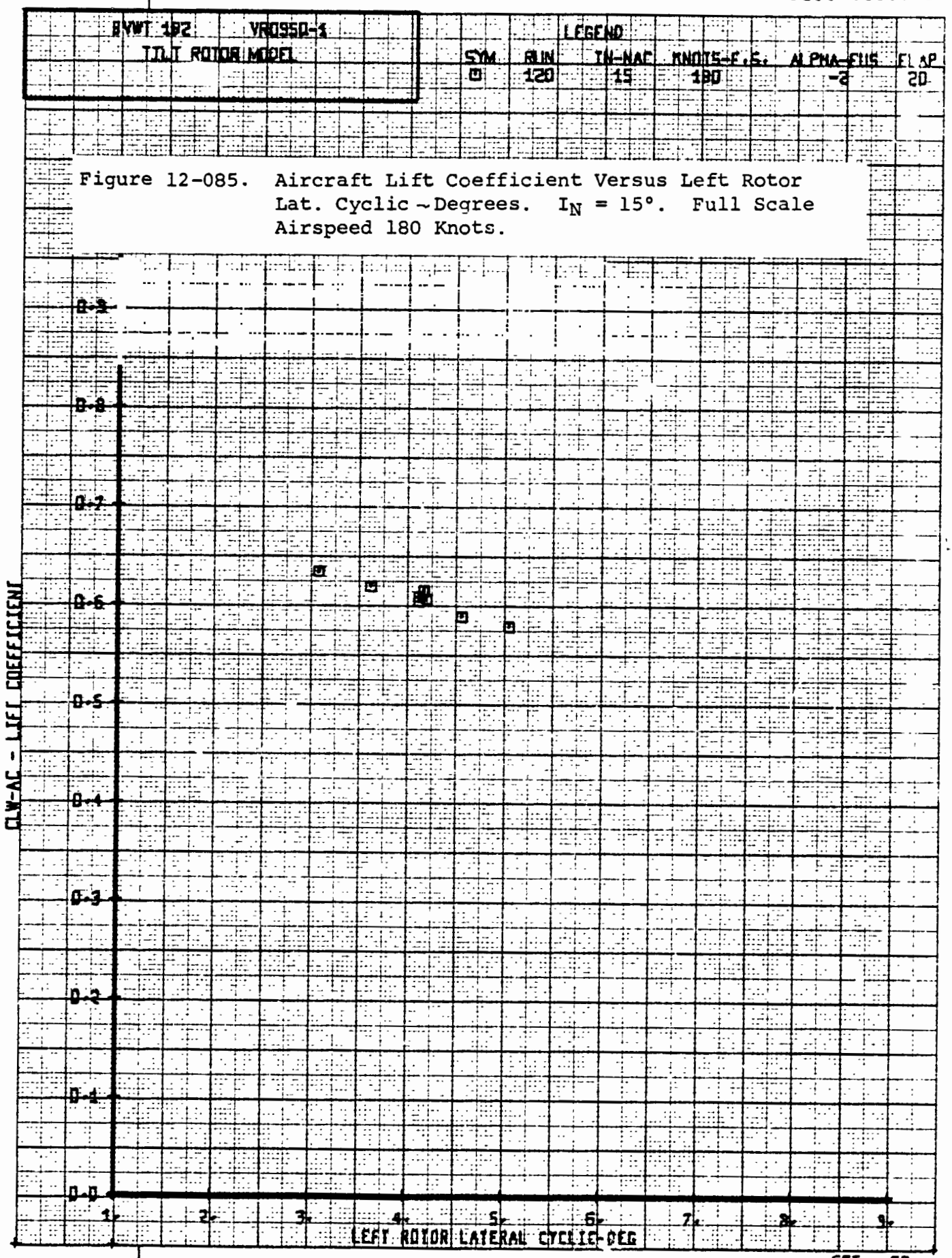


Figure 12-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

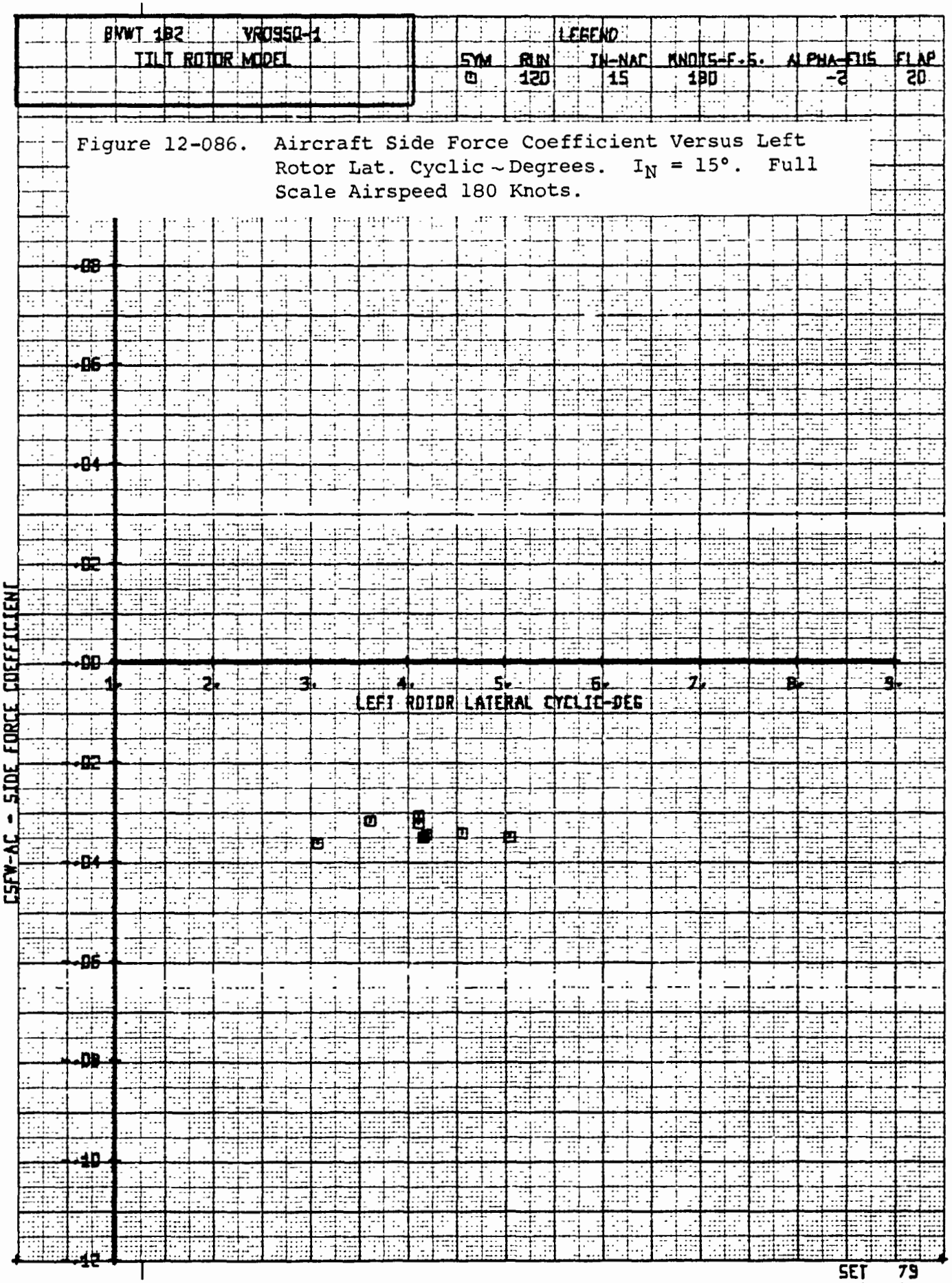


Figure 12-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

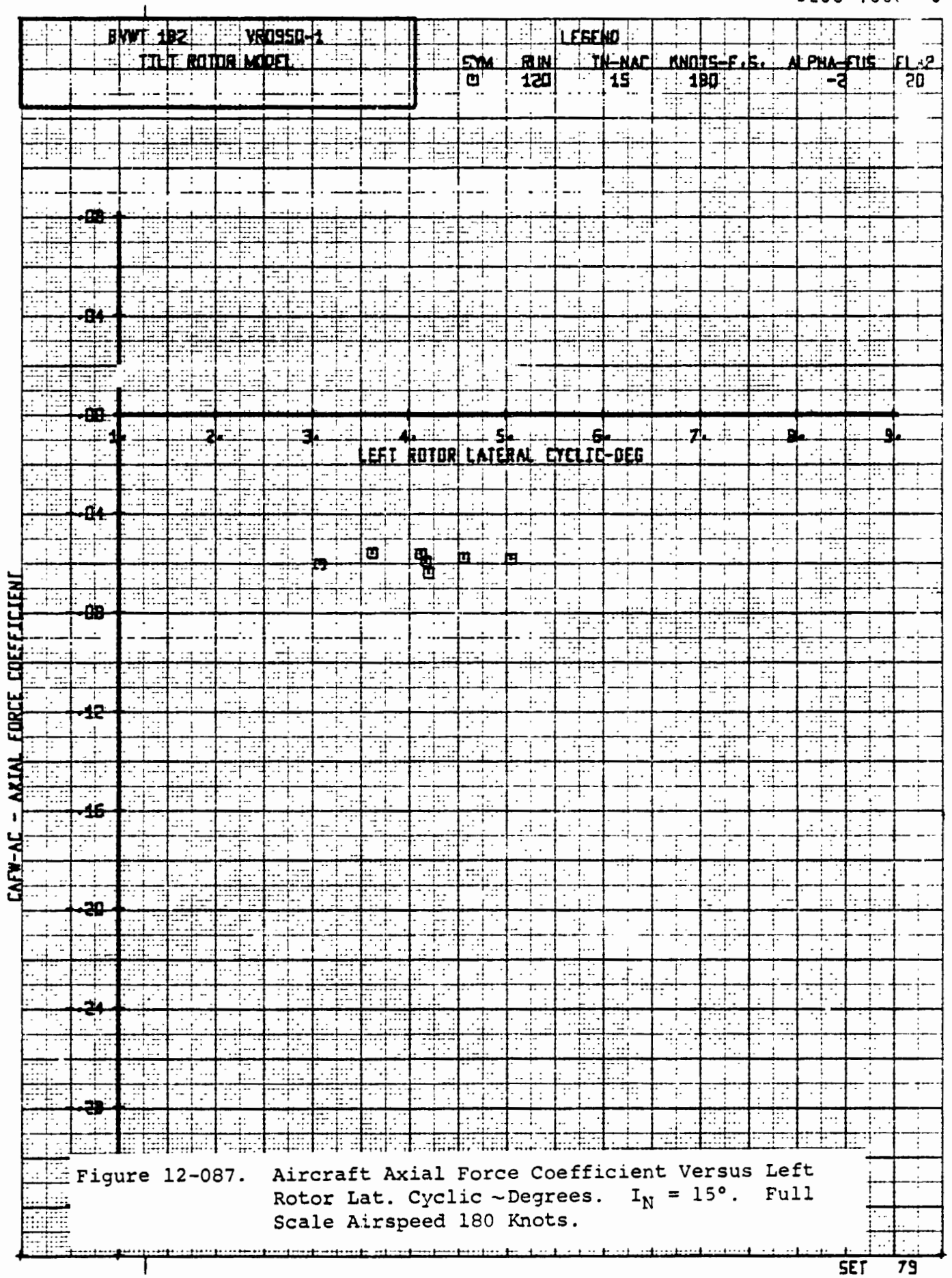


Figure 12-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

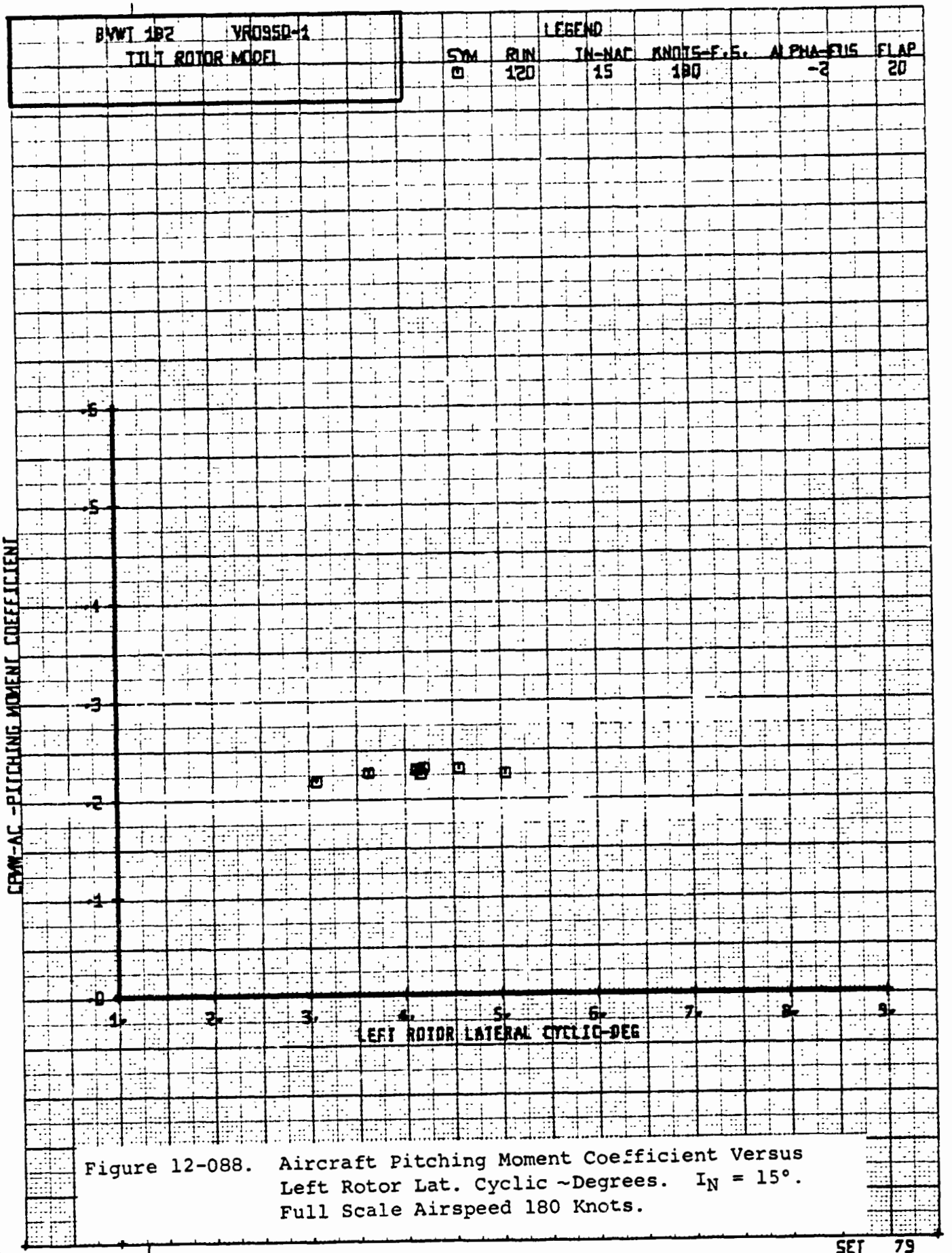


Figure 12-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

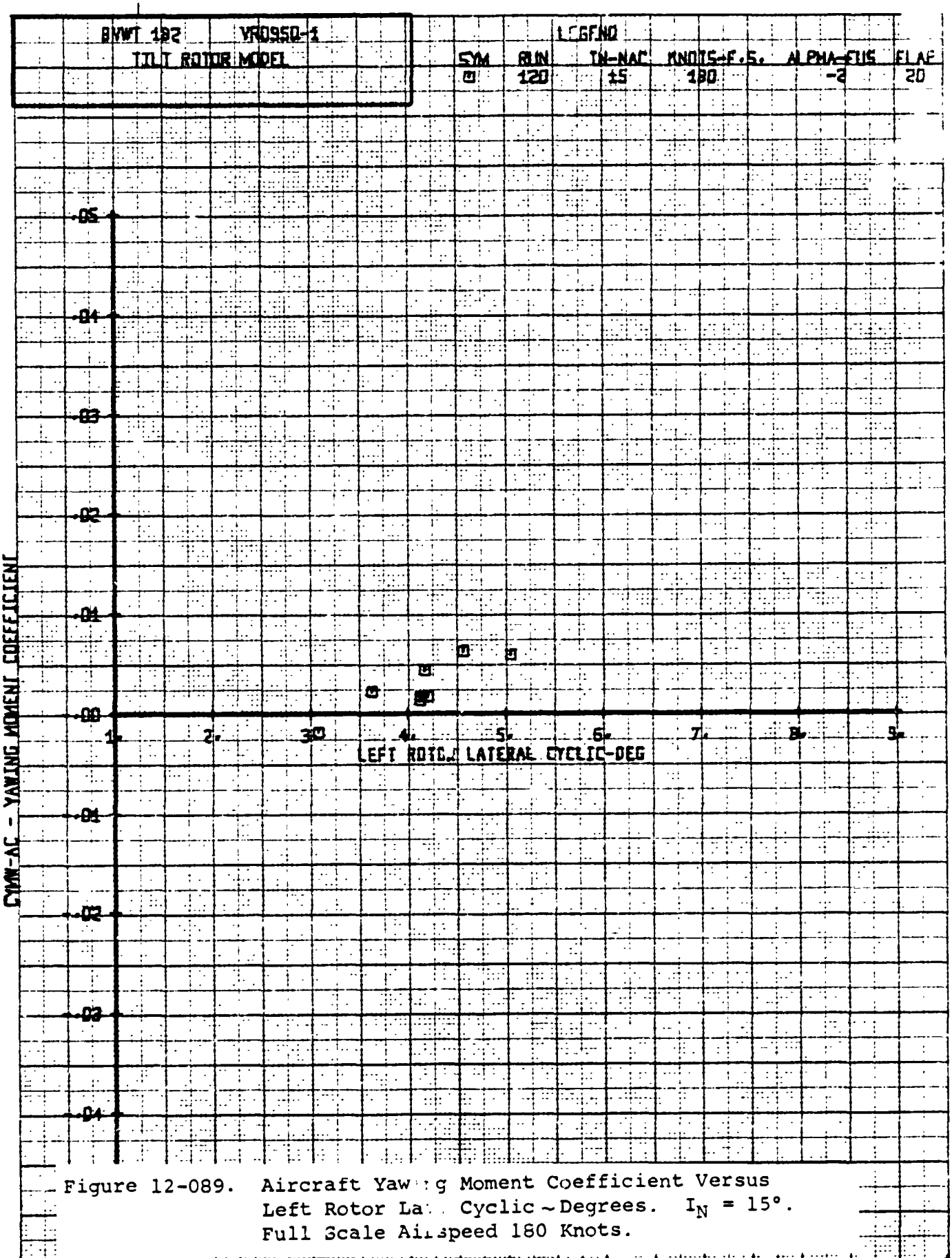


Figure 12-089. Aircraft Yawing Moment Coefficient Versus Left Rotor Lateral Cyclic - Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

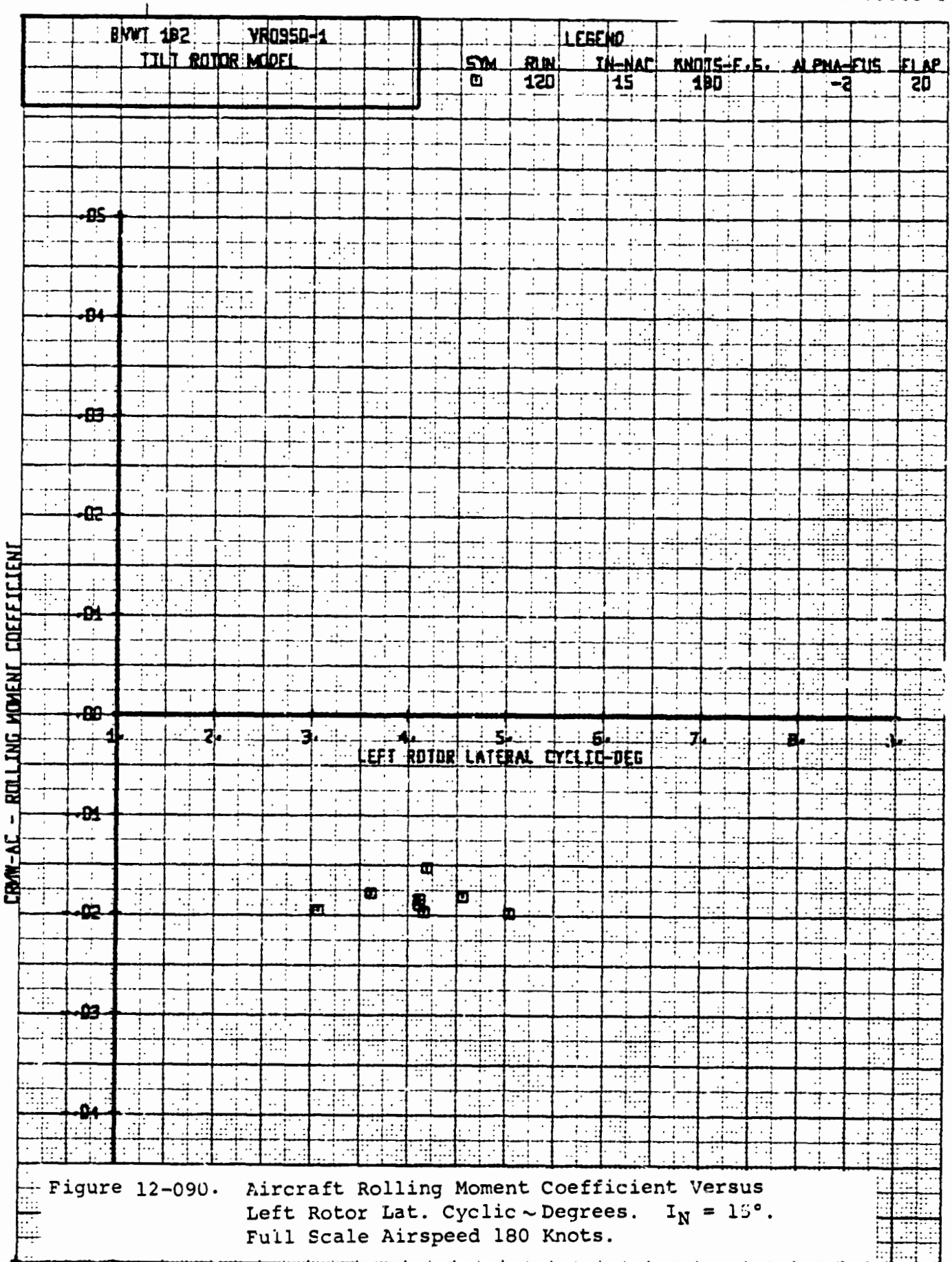


Figure 12-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

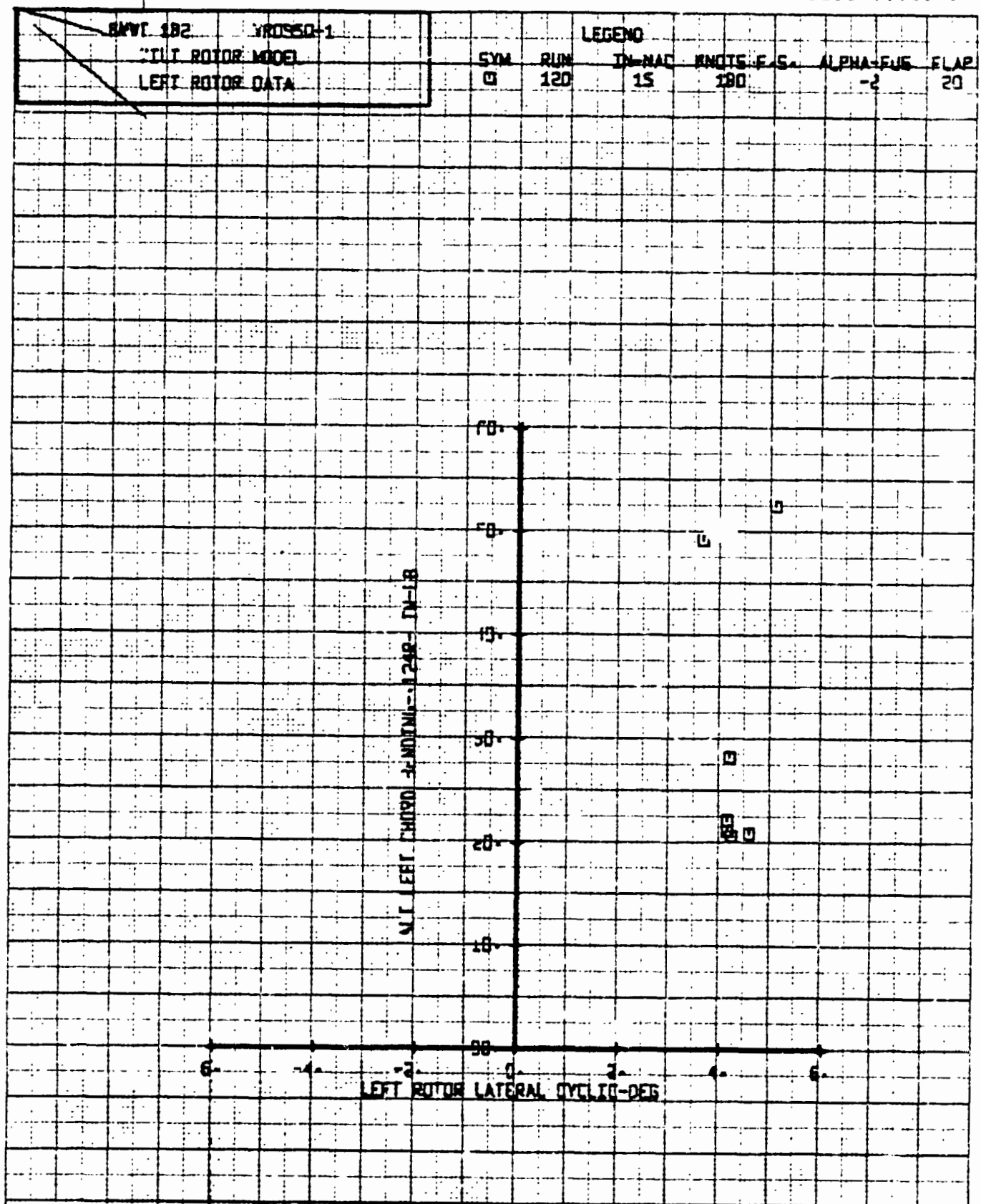


Figure 12-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

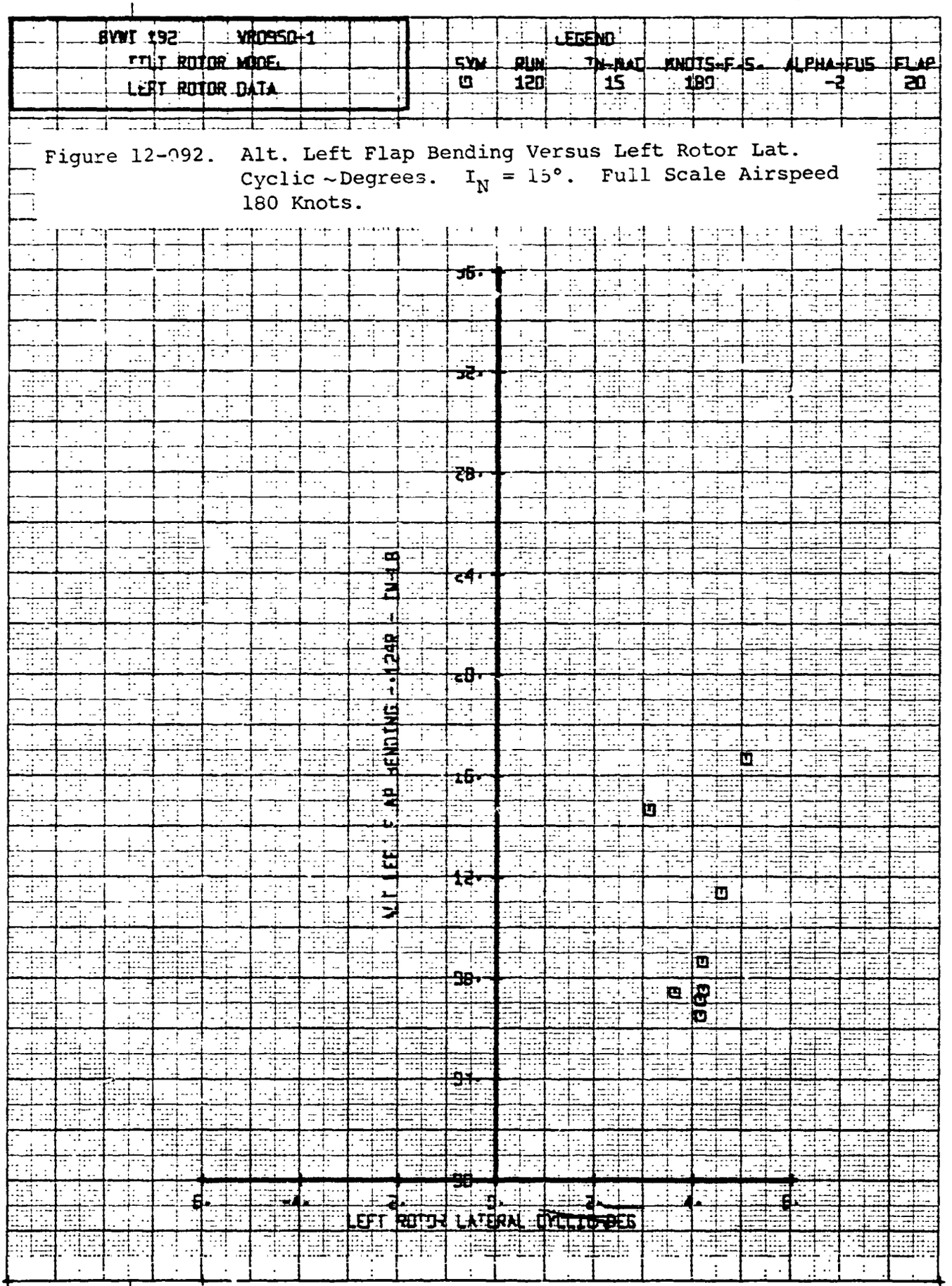


Figure 12-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

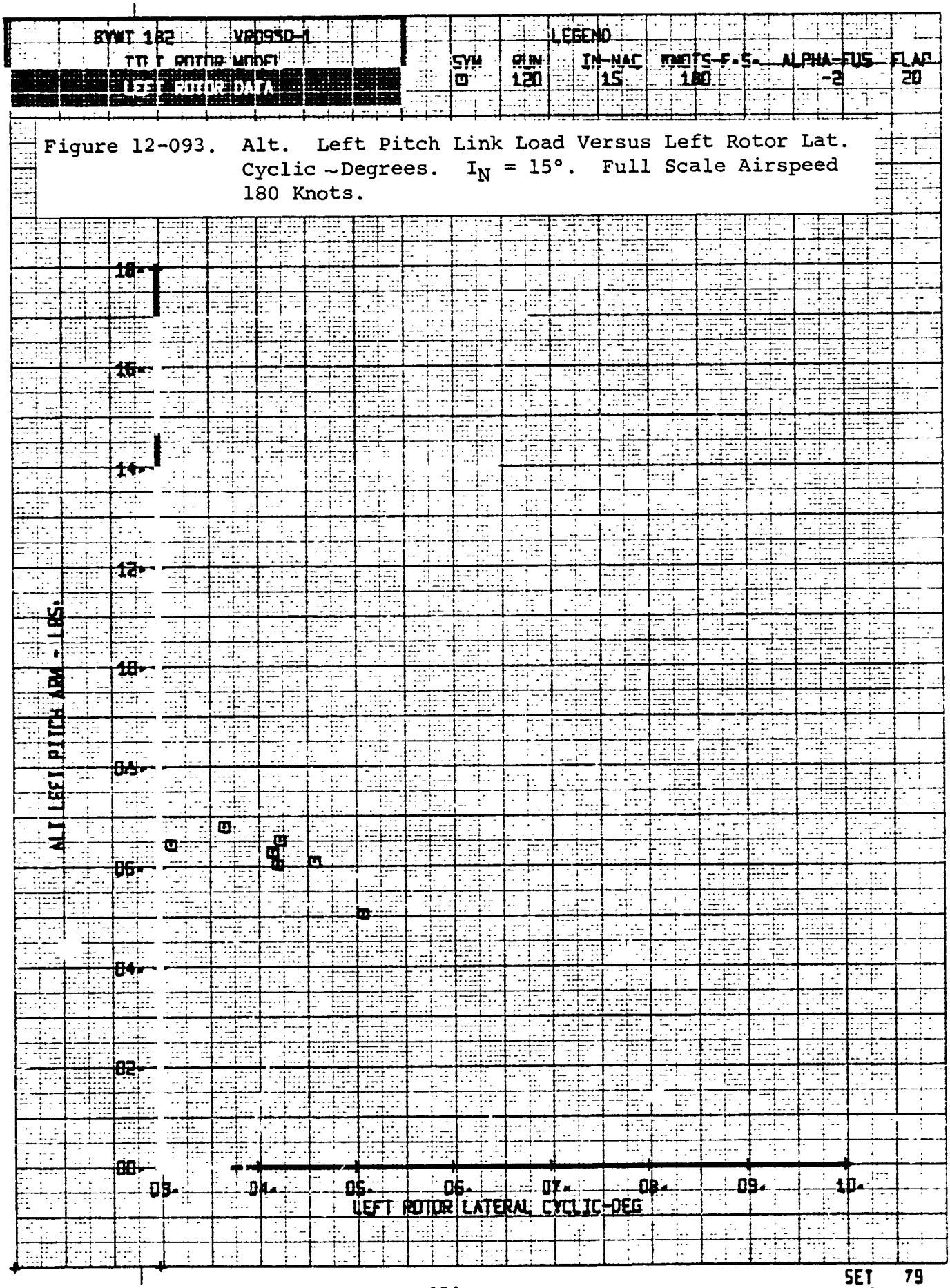


Figure 12-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

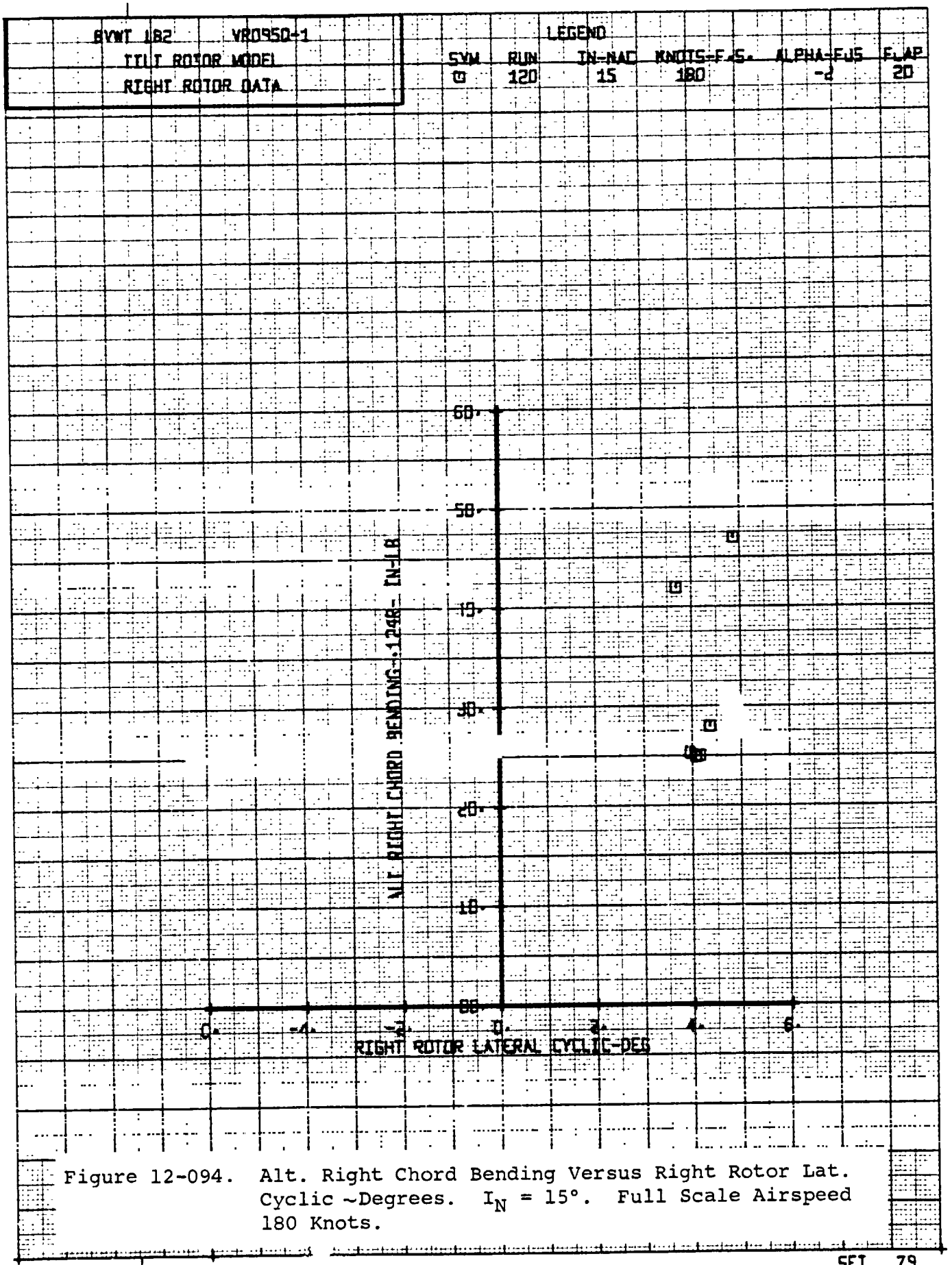


Figure 12-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

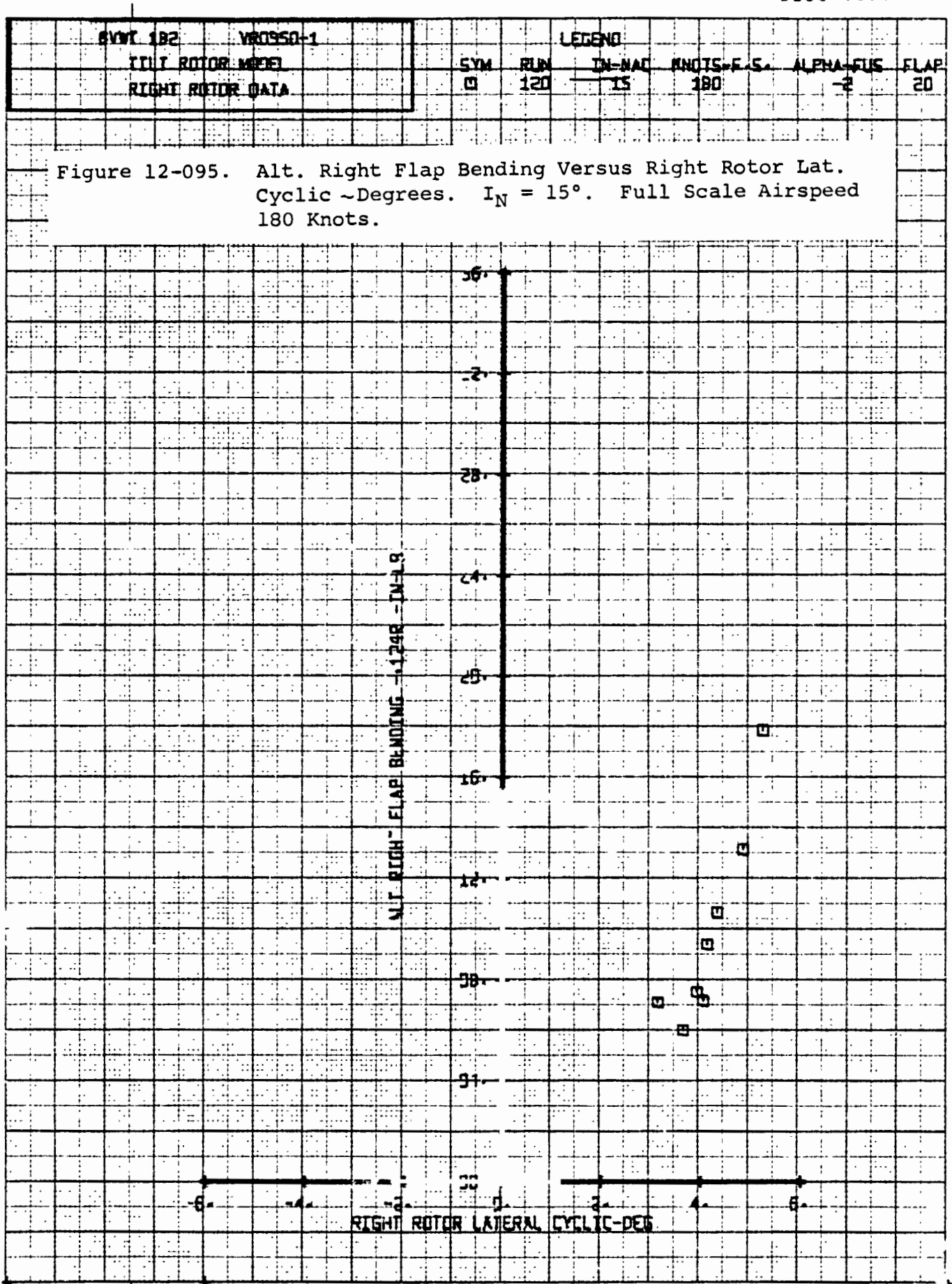


Figure 12-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

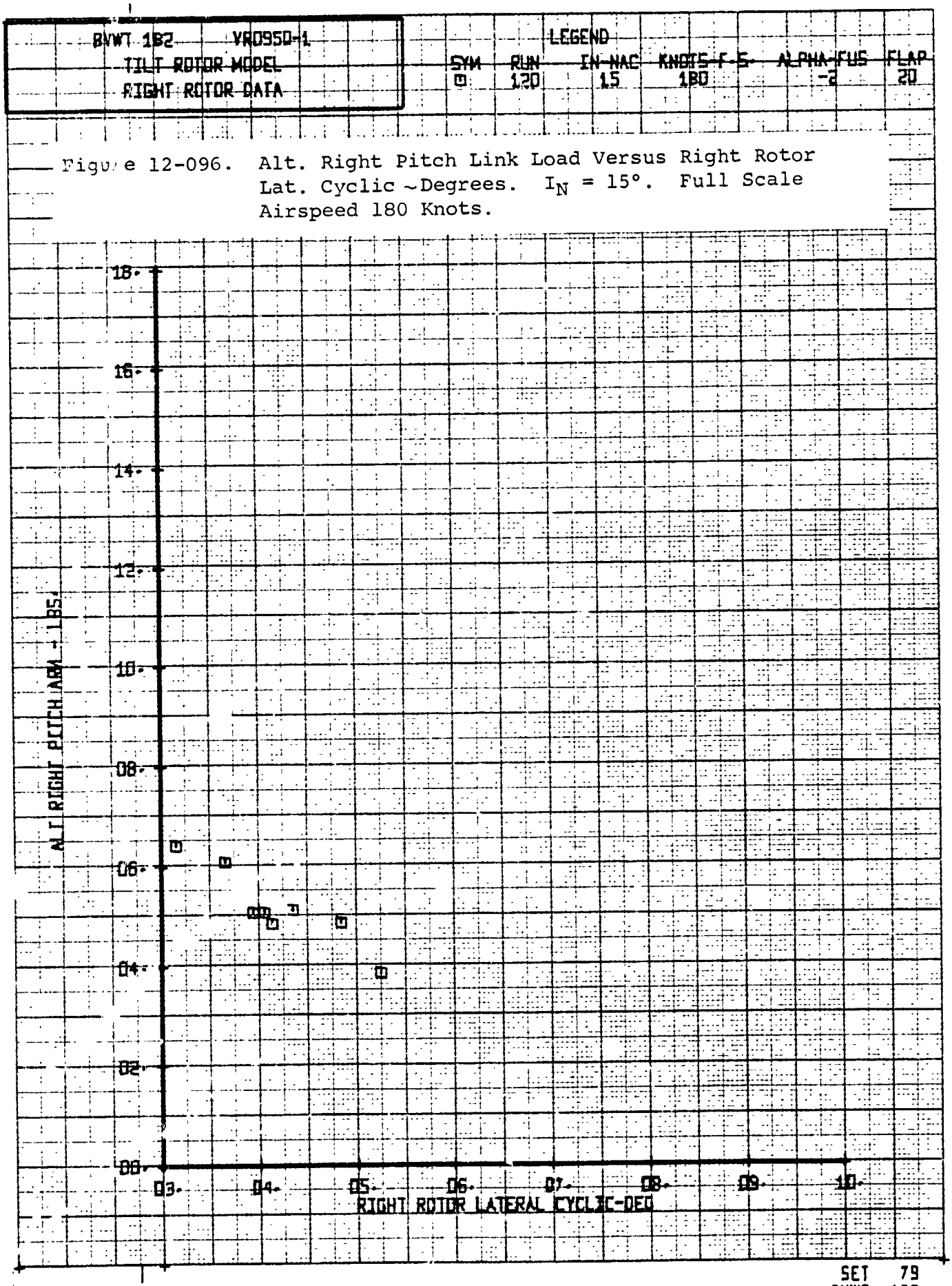


Figure 12-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

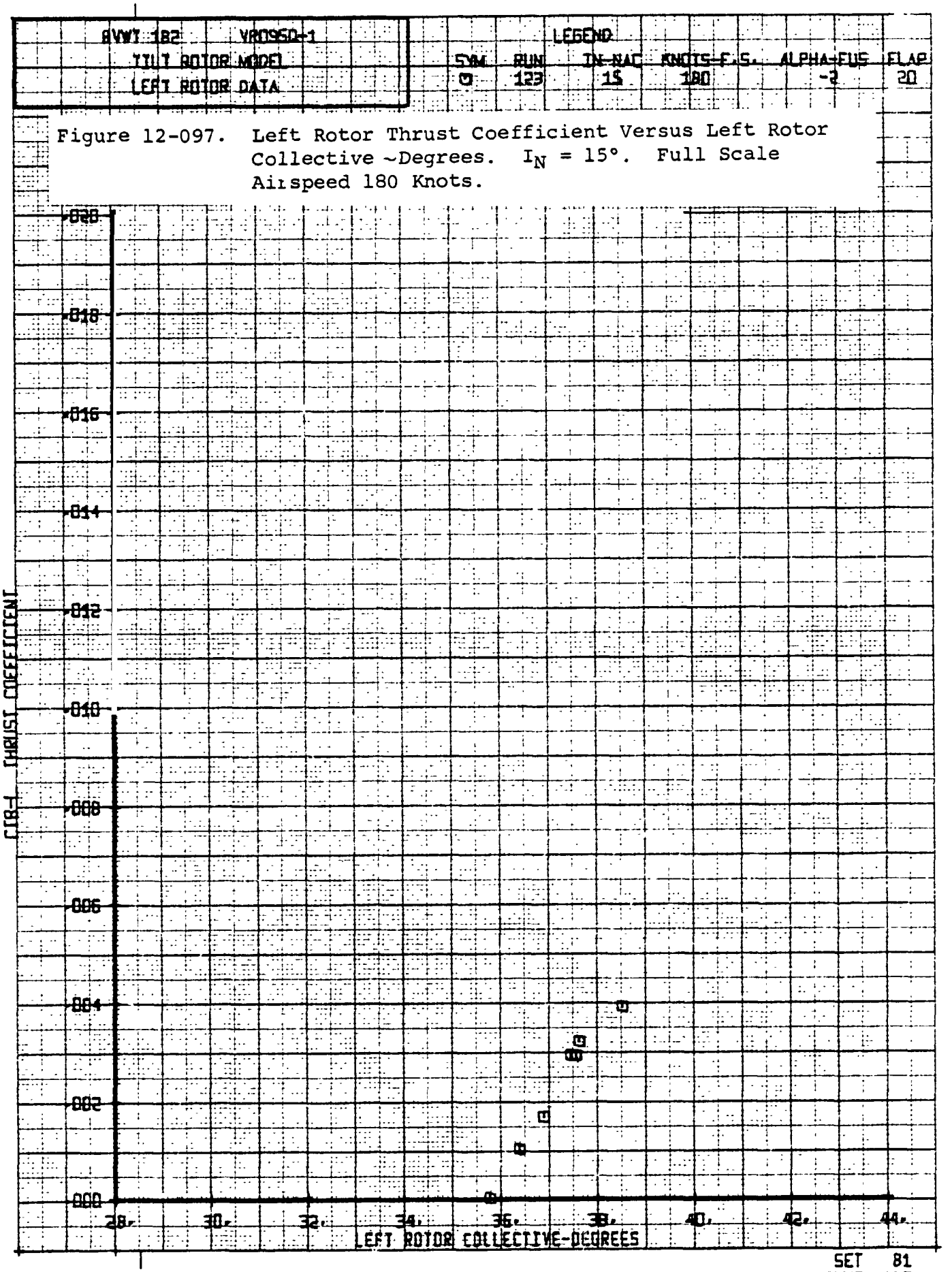


Figure 12-097. Left Rotor Thrust Coefficient Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

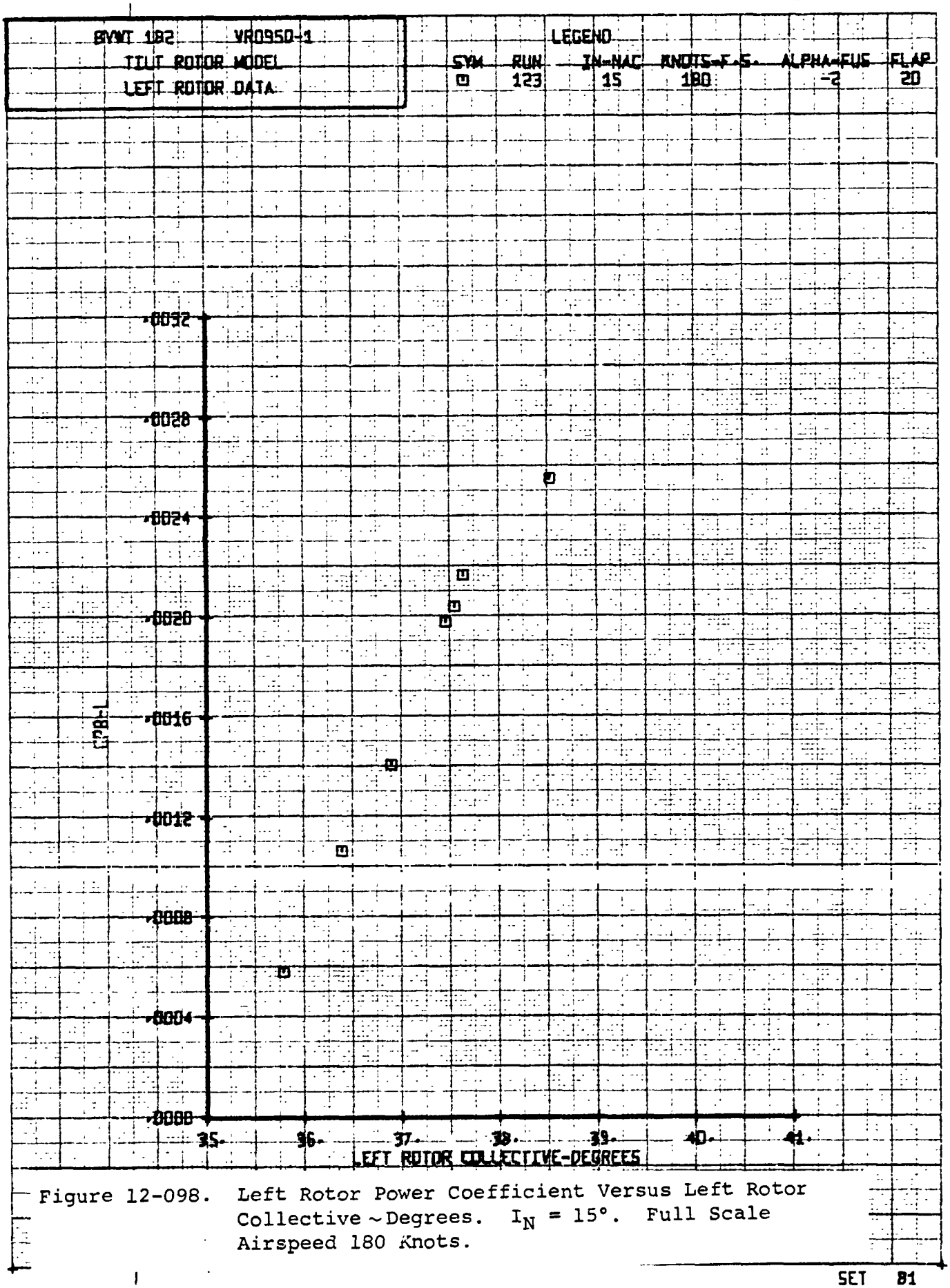


Figure 12-098. Left Rotor Power Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

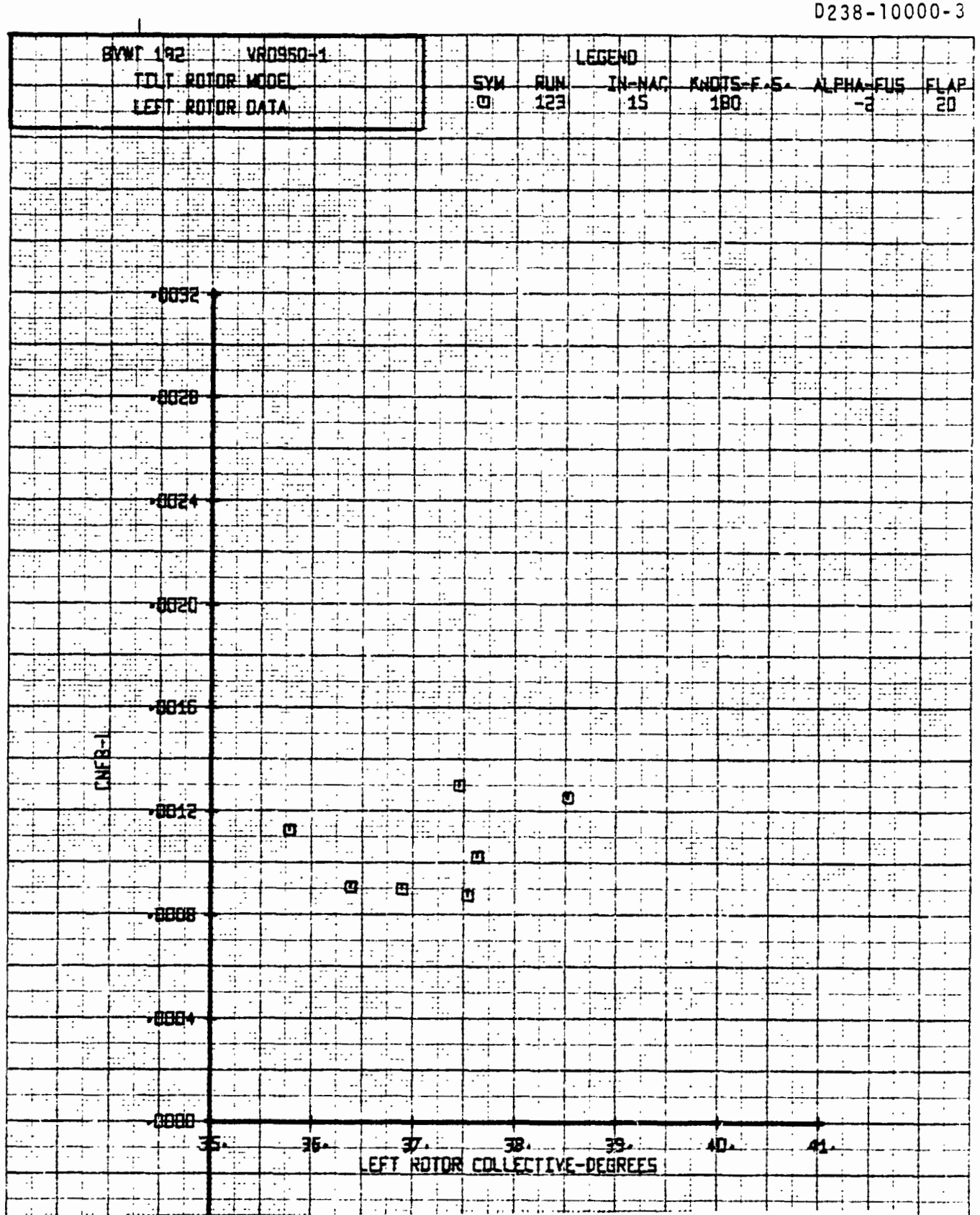


Figure 12-099. Left Rotor Normal Force Coefficient Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

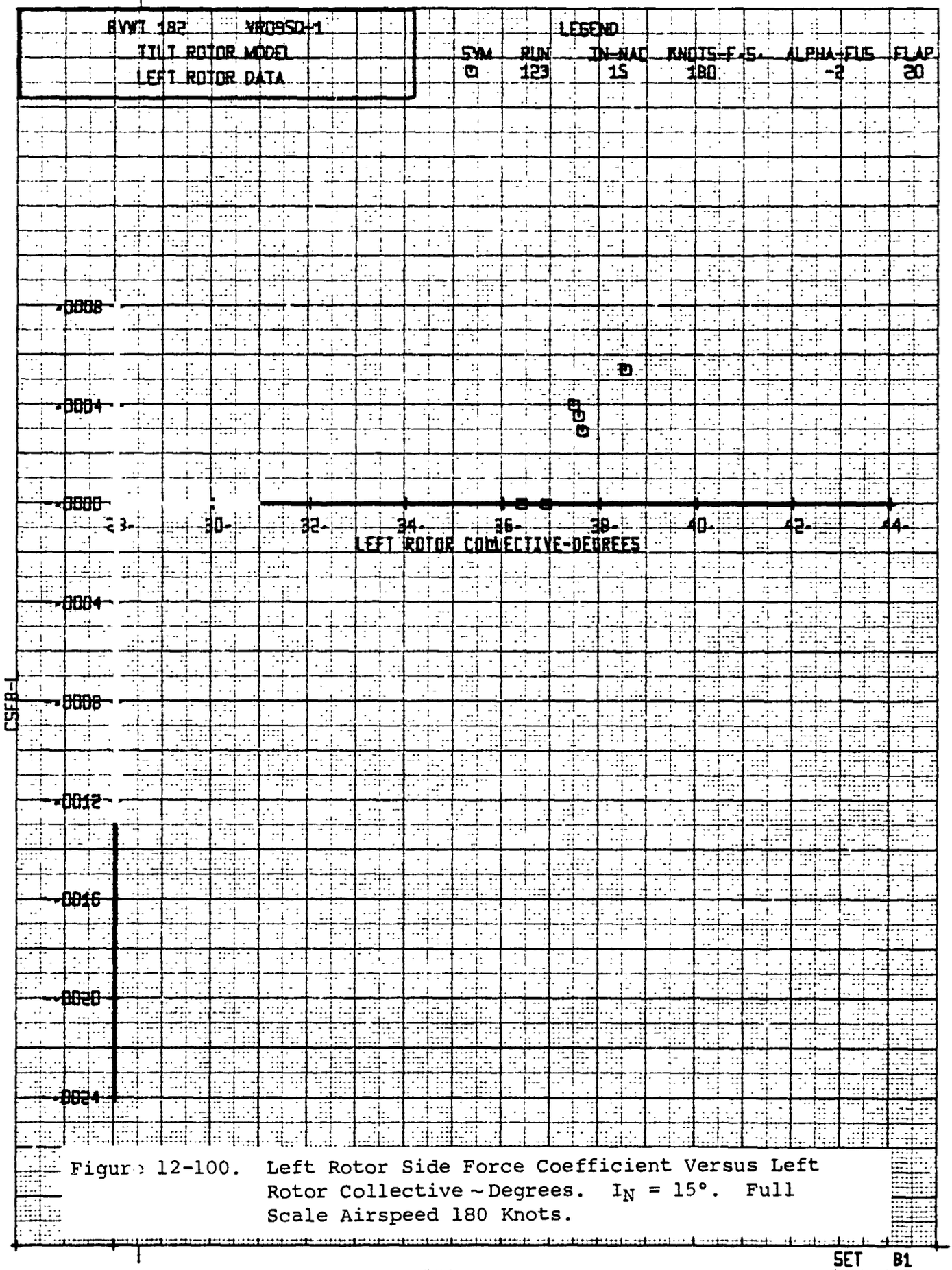


Figure 12-100. Left Rotor Side Force Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

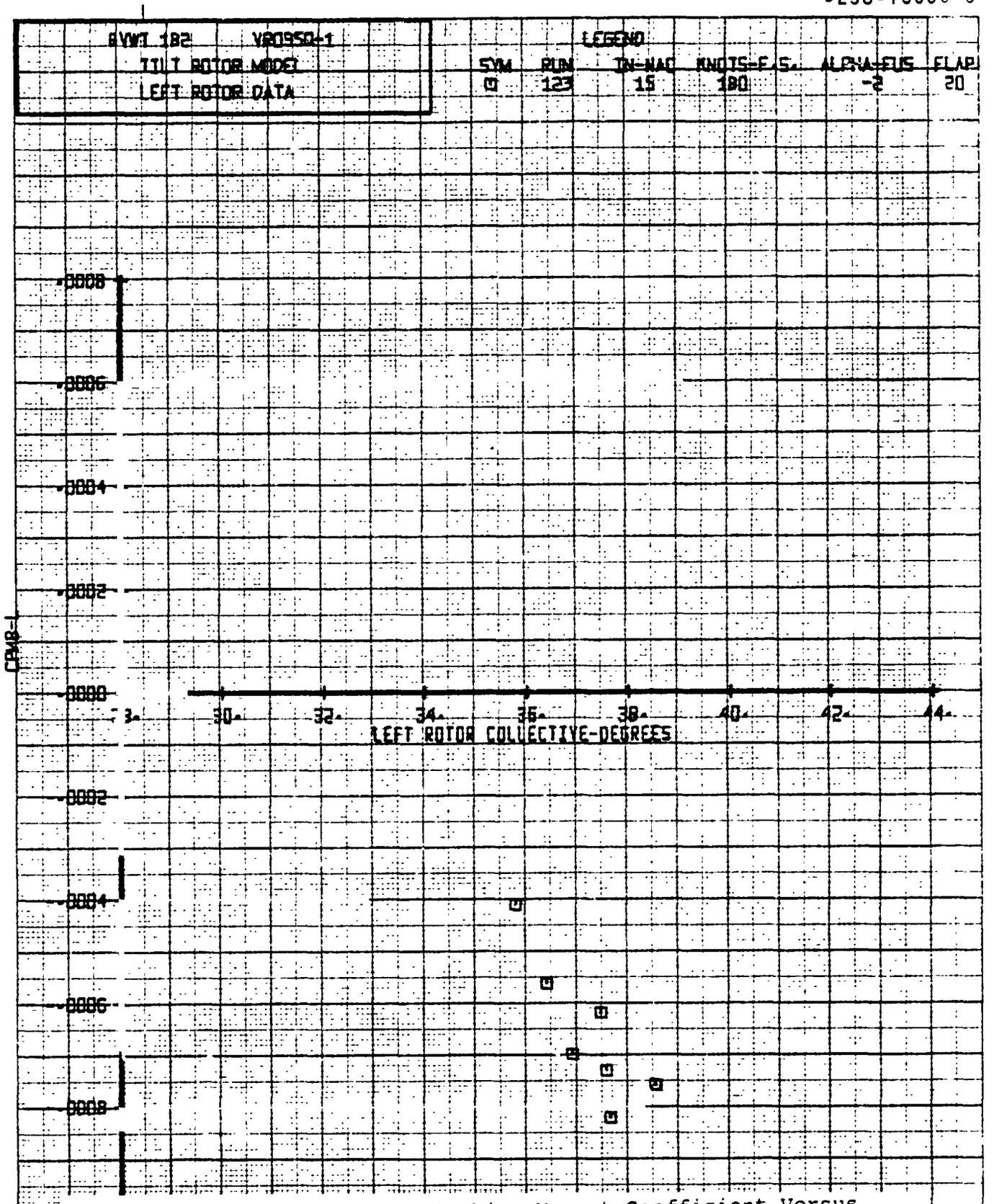


Figure 12-101. Left Rotor Pitching Moment Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

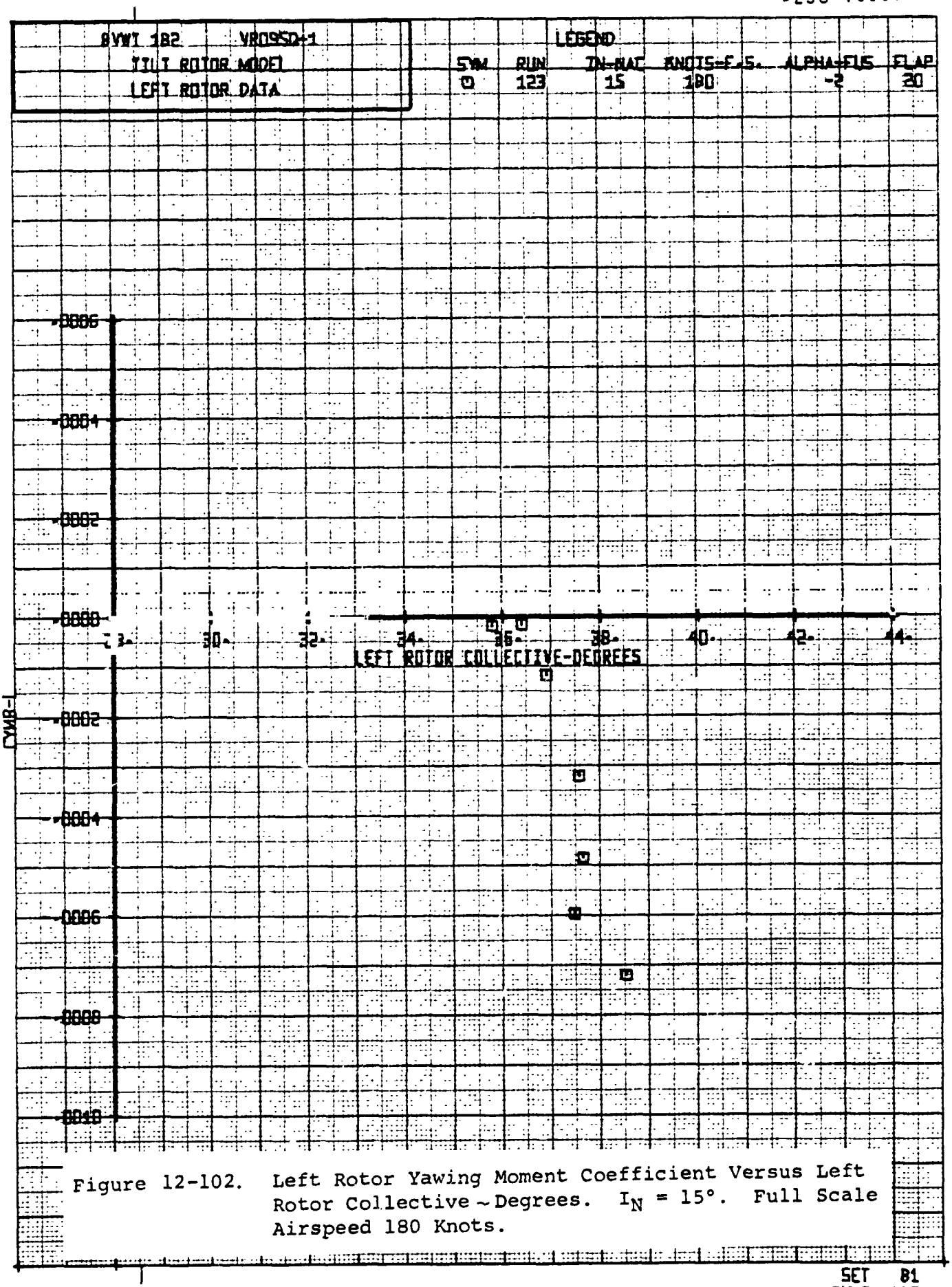


Figure 12-102. Left Rotor Yawing Moment Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

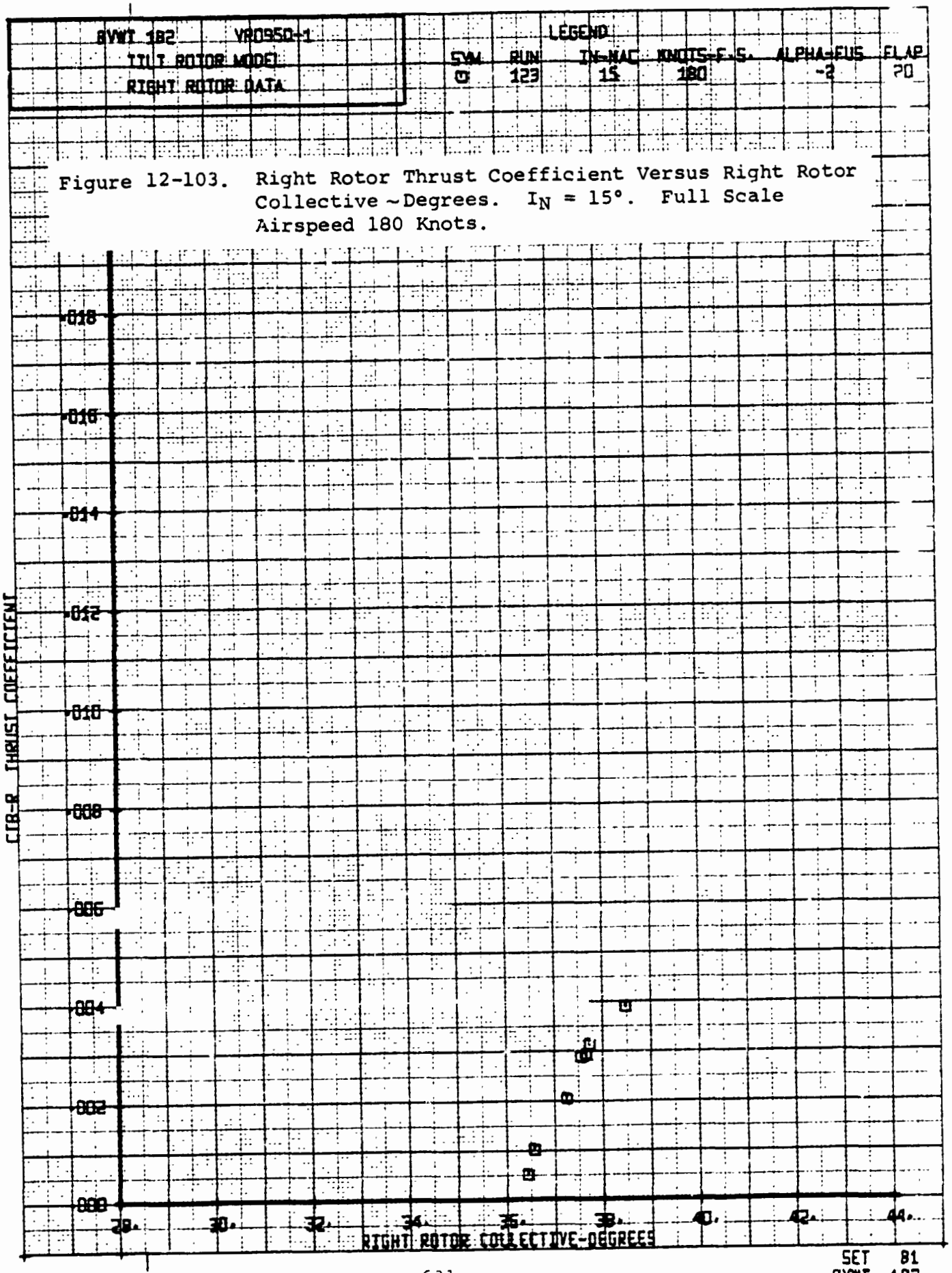


Figure 12-103. Right Rotor Thrust Coefficient Versus Right Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

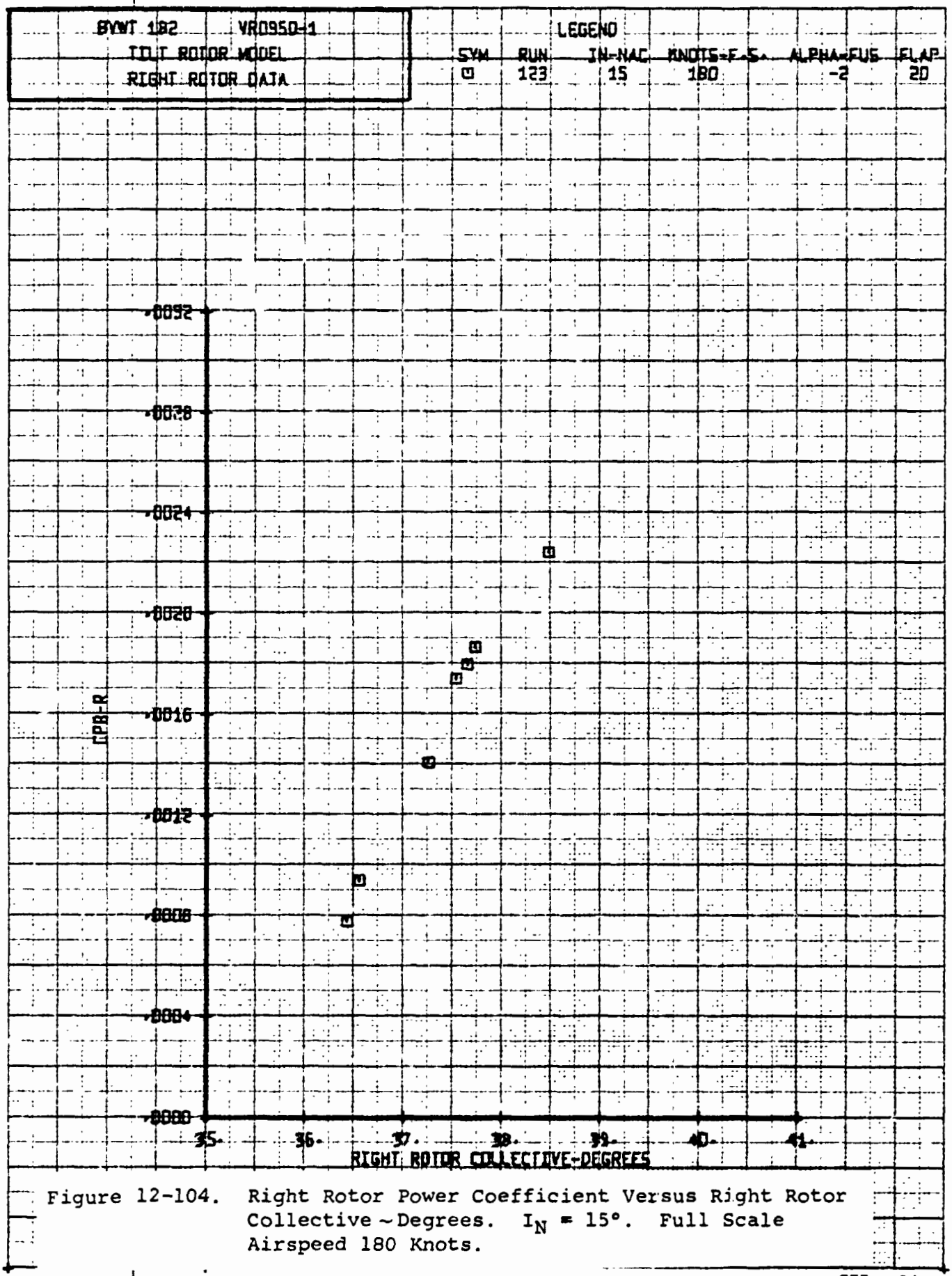


Figure 12-104. Right Rotor Power Coefficient Versus Right Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

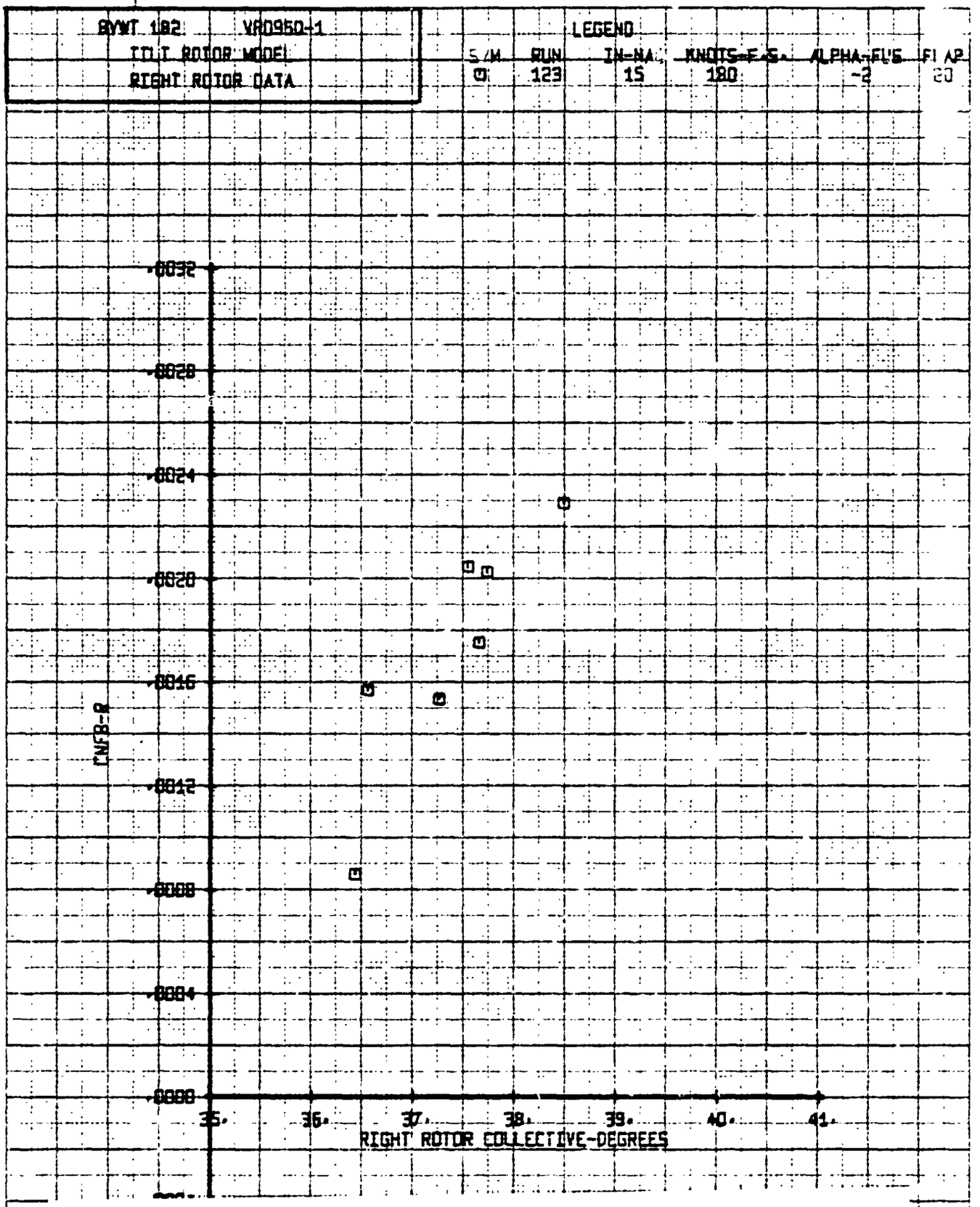


Figure 12-105. Right Rotor Normal Force Coefficient Versus Right Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

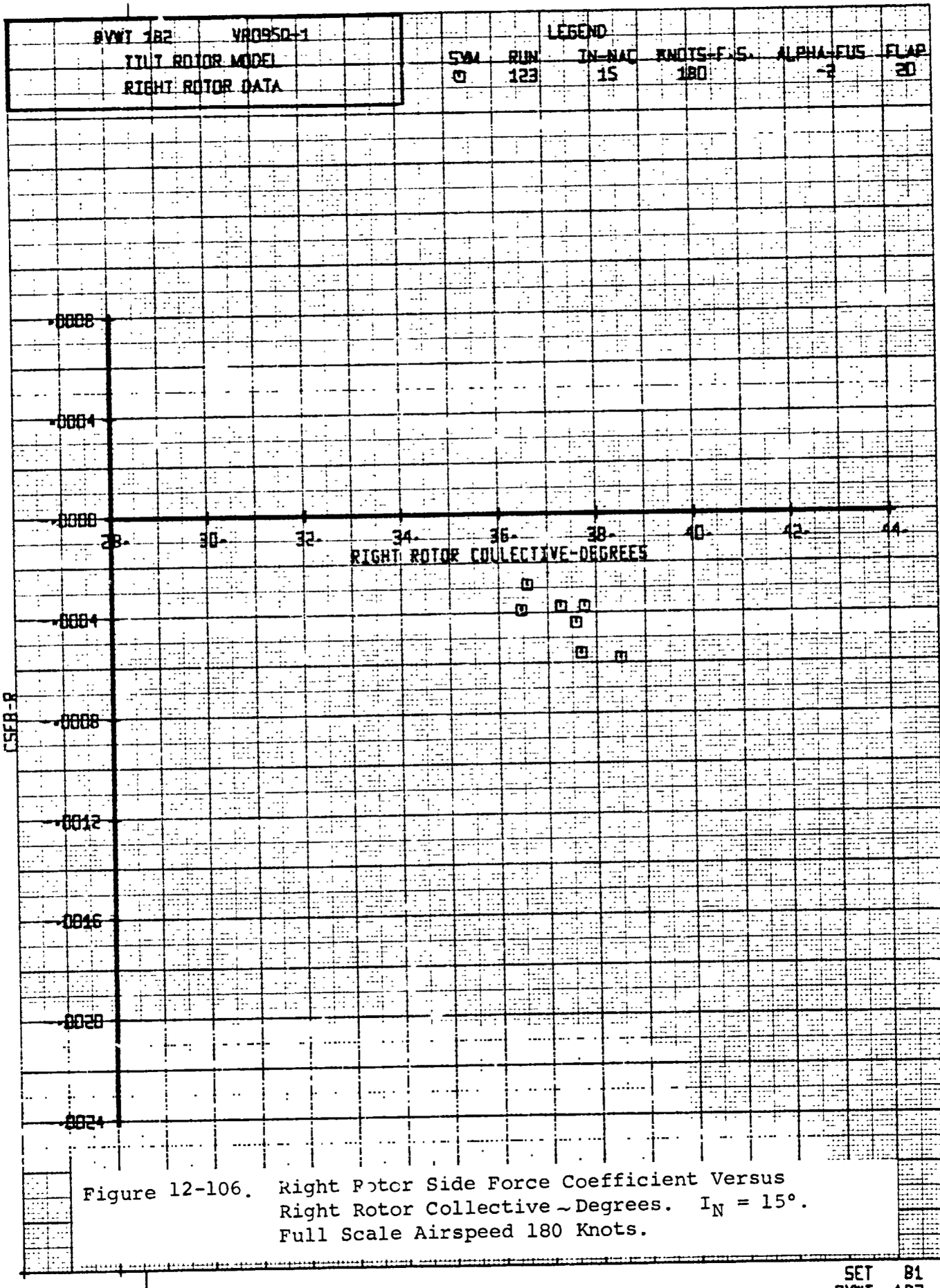


Figure 12-106. Right Rotor Side Force Coefficient Versus Right Rotor Collective - Degrees. $I_N = 15°$. Full Scale Airspeed 180 Knots.

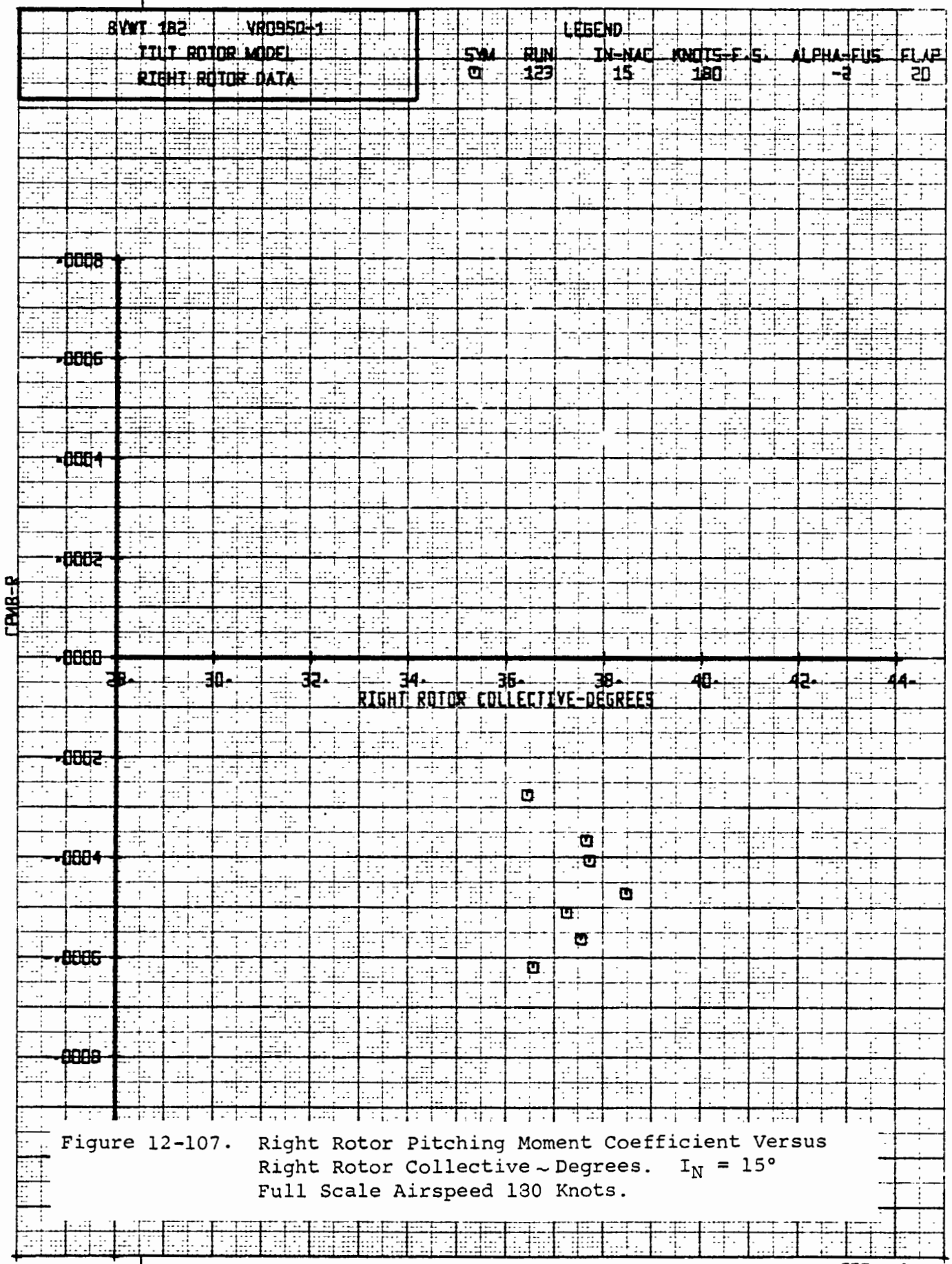


Figure 12-107. Right Rotor Pitching Moment Coefficient Versus Right Rotor Collective ~ Degrees. I_N = 15° Full Scale Airspeed 130 Knots.

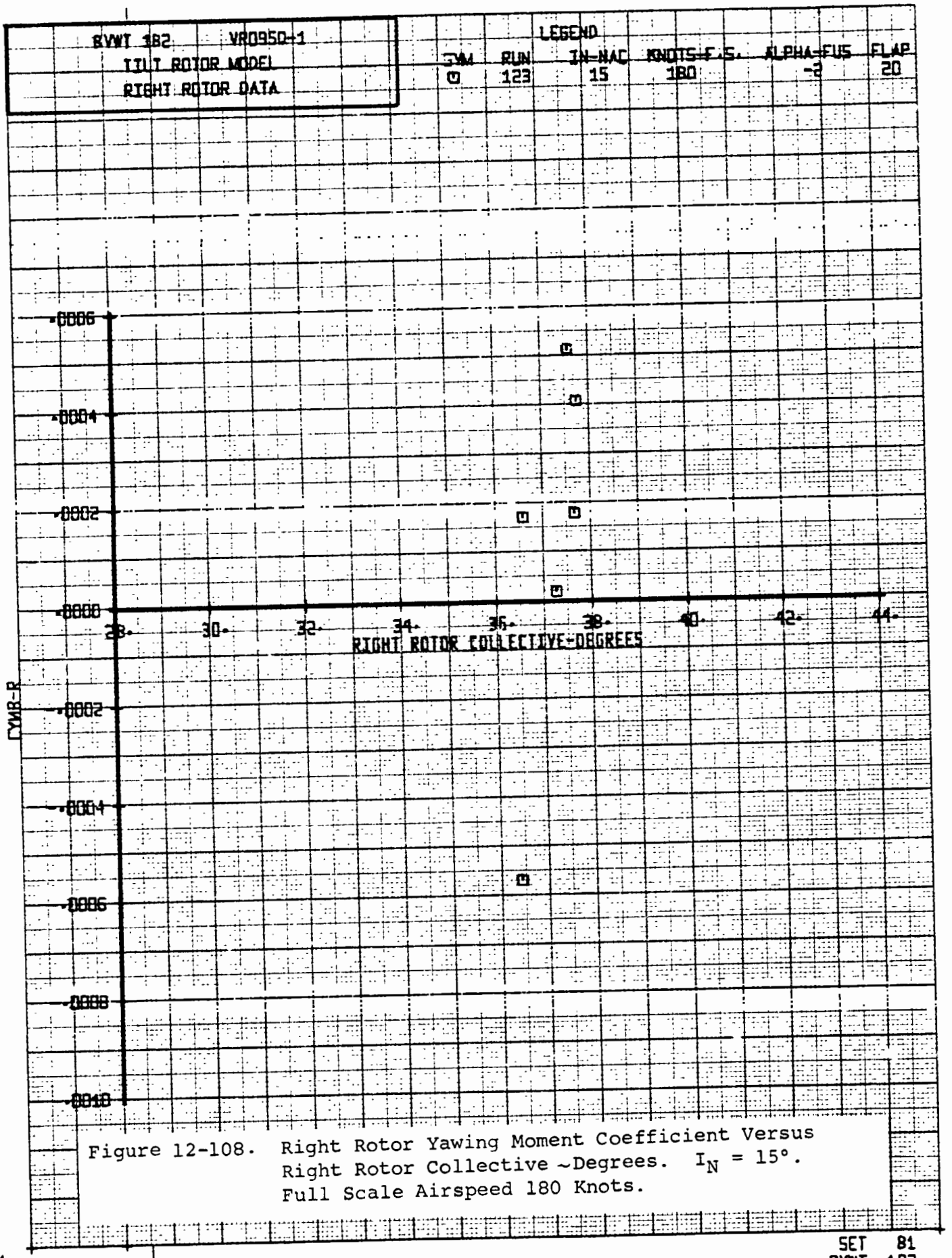


Figure 12-108. Right Rotor Yawing Moment Coefficient Versus Right Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

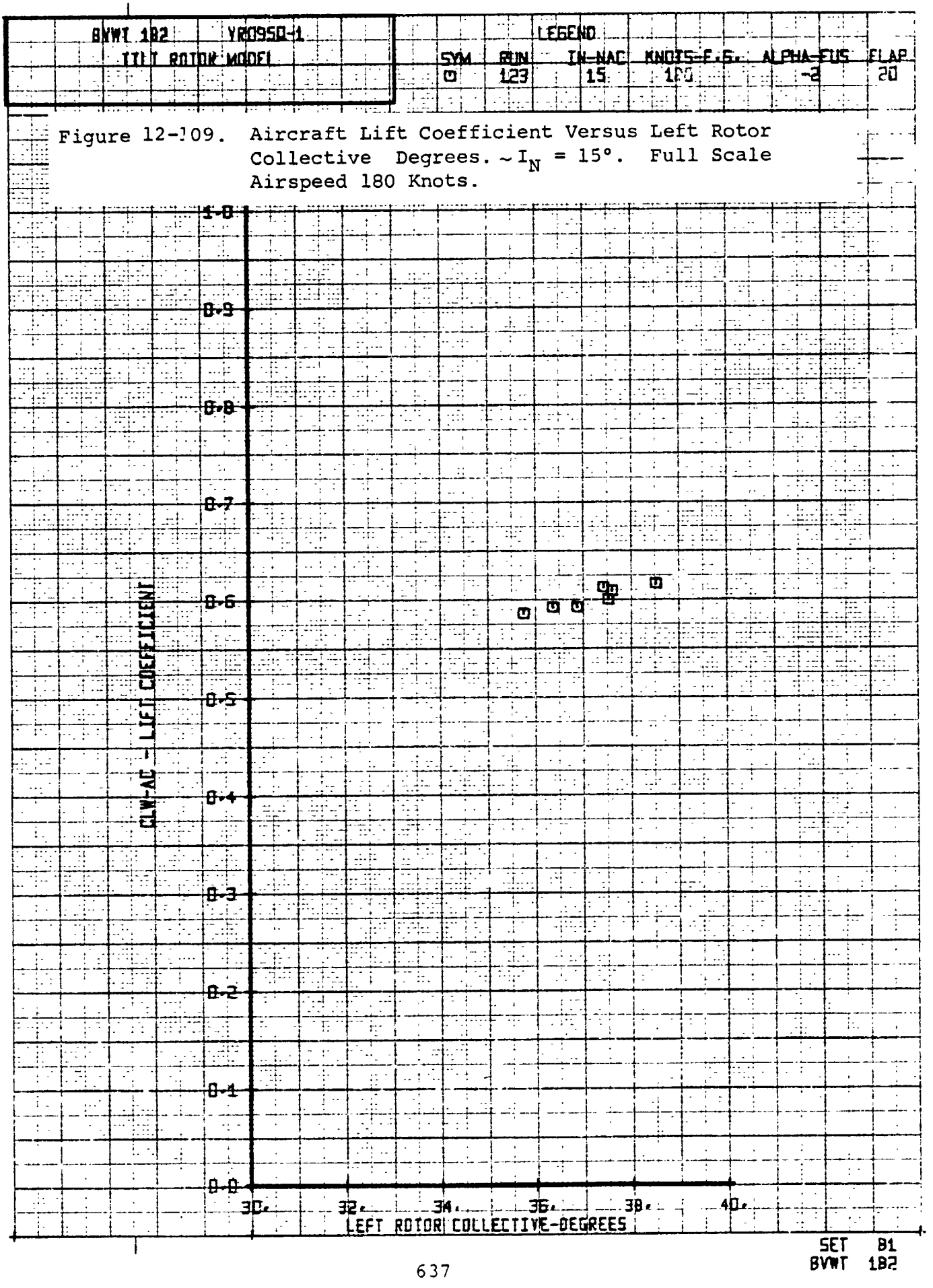


Figure 12-109. Aircraft Lift Coefficient Versus Left Rotor Collective Degrees. ~ I_N = 15°. Full Scale Airspeed 180 Knots.

FT B1
Y 182

SET B1
BVWT 182

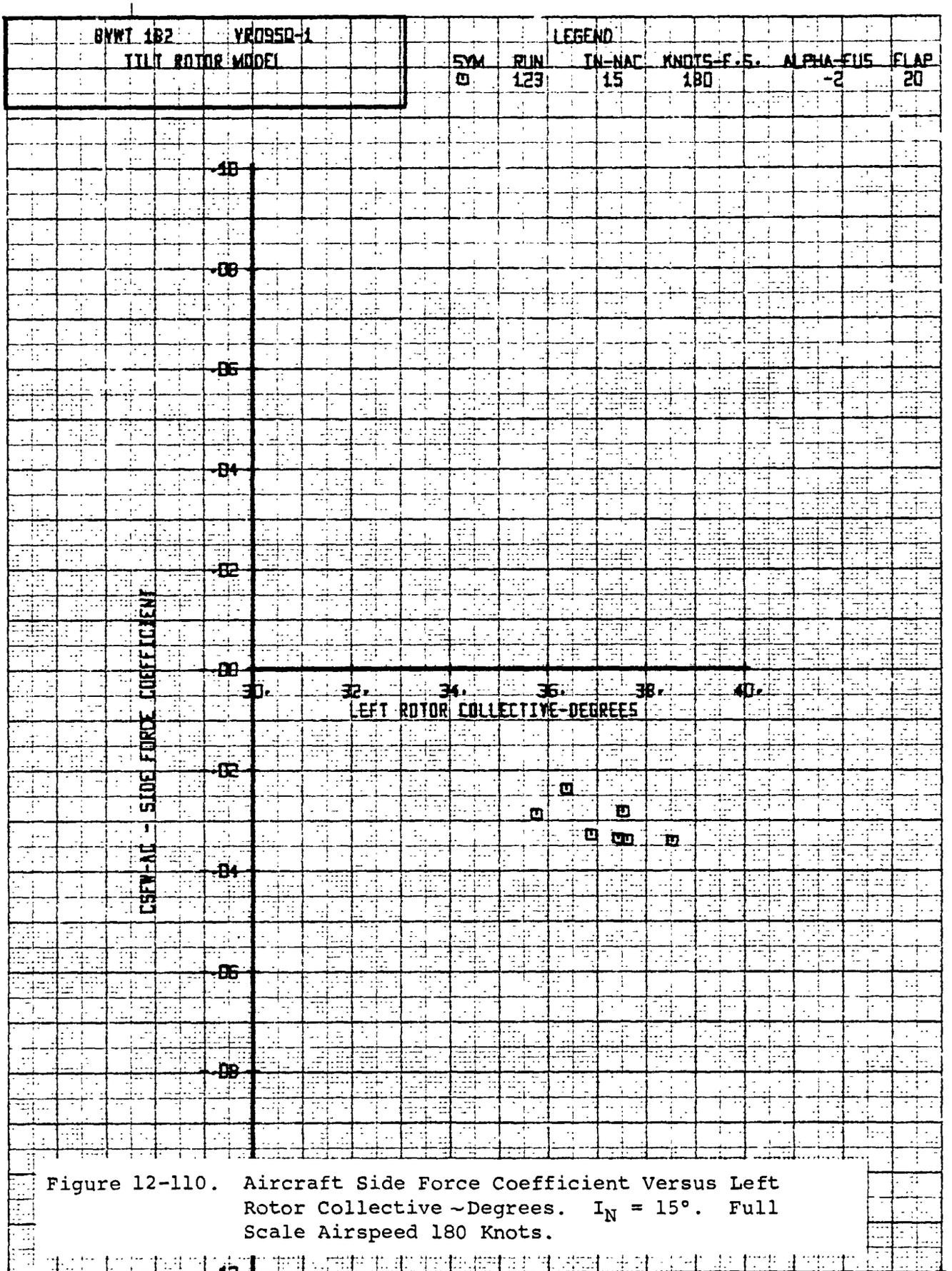


Figure 12-110. Aircraft Side Force Coefficient Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

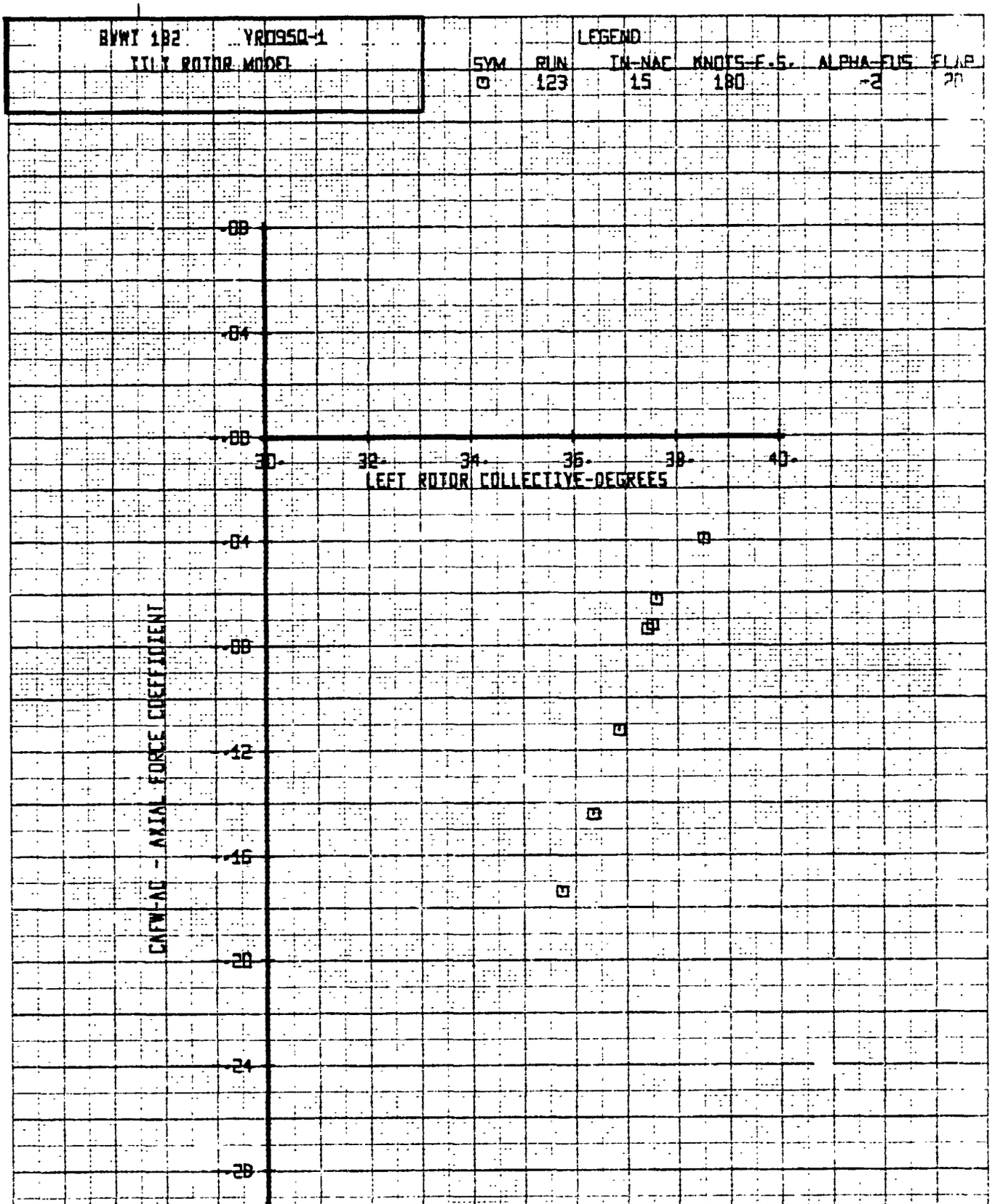


Figure 12-111. Aircraft Axial Force Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

FT B1
182

SET B1
BVWT 182

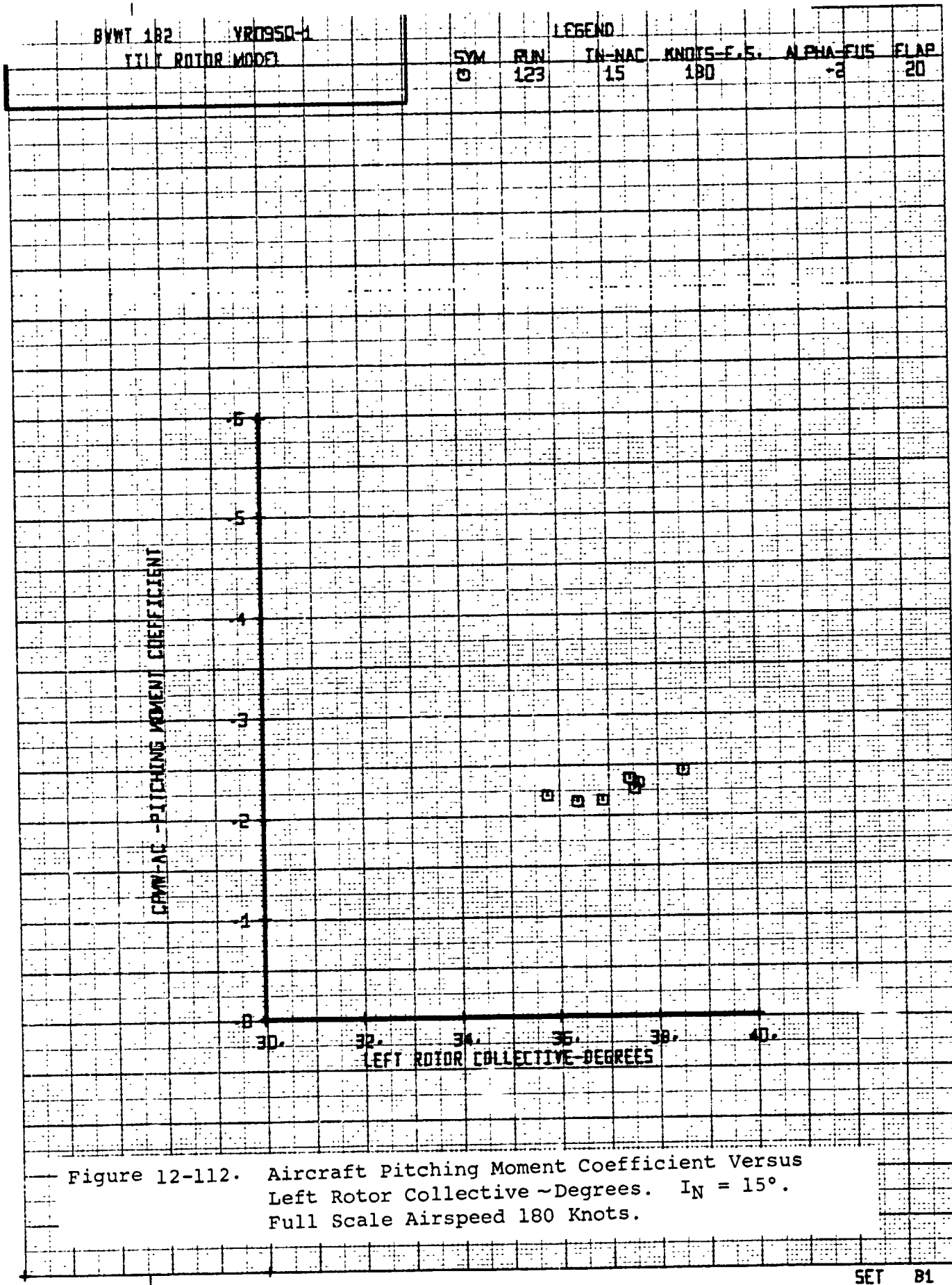


Figure 12-112. Aircraft Pitching Moment Coefficient Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

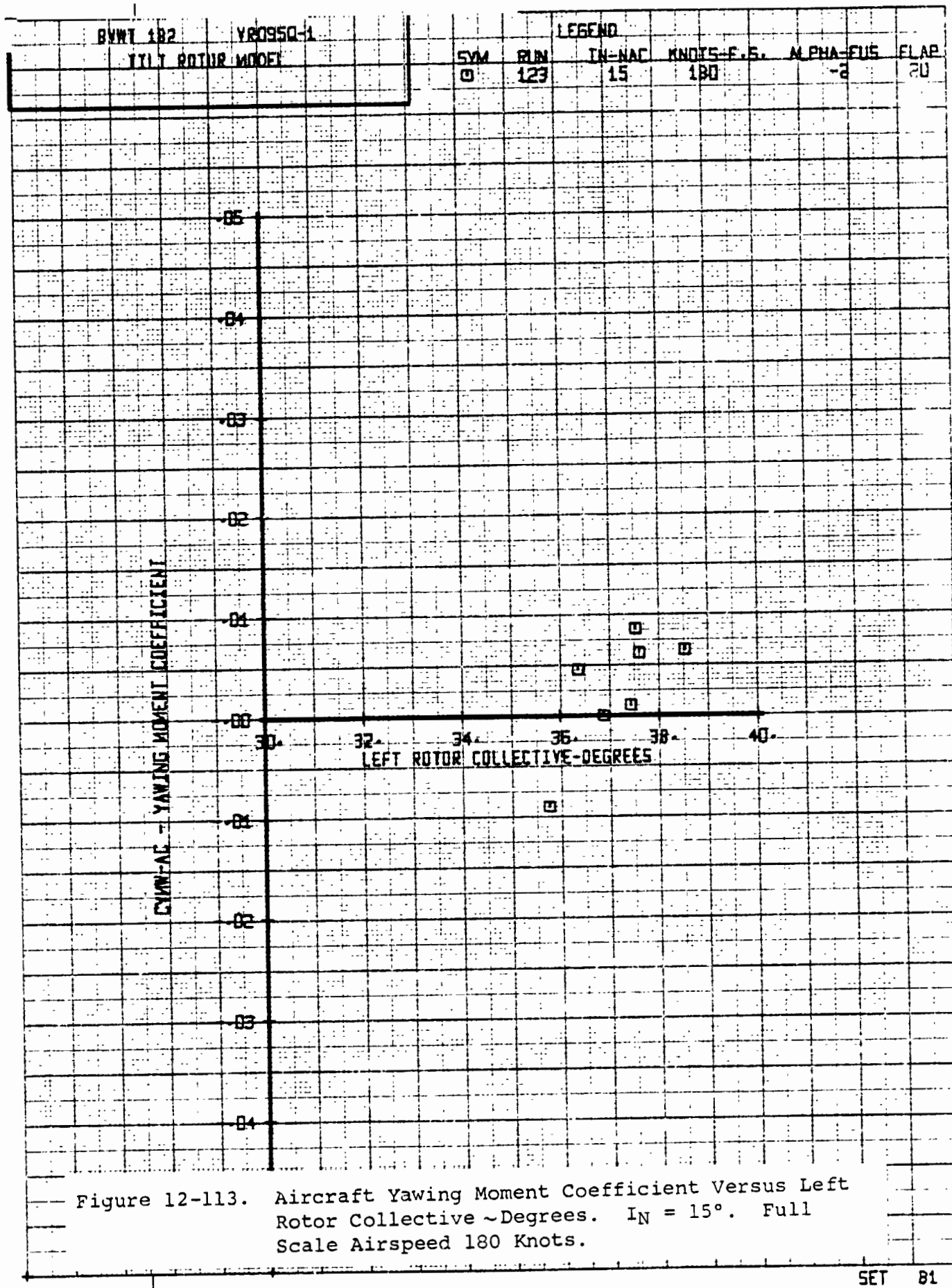


Figure 12-113. Aircraft Yawing Moment Coefficient Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

FT B1
V 182

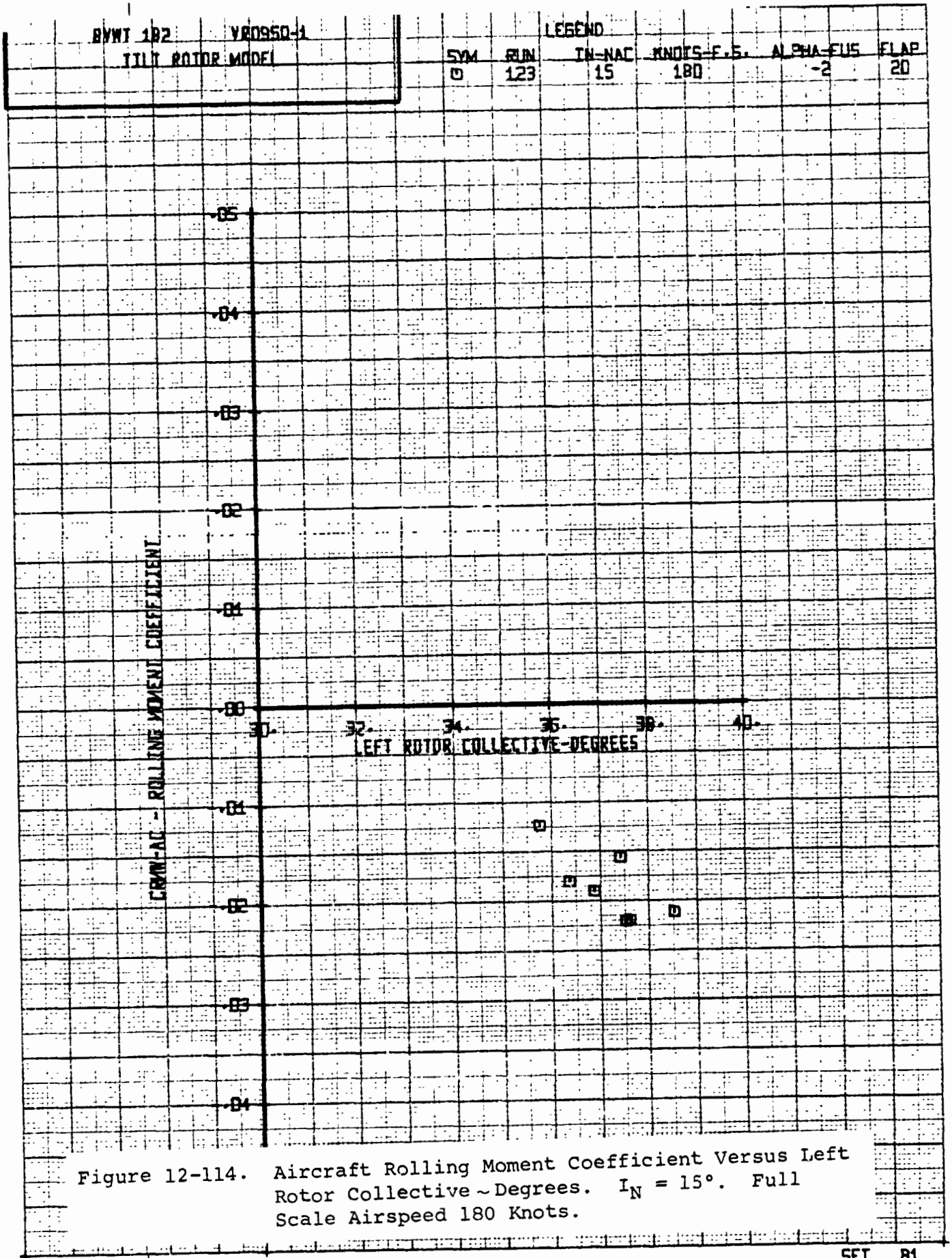


Figure 12-114. Aircraft Rolling Moment Coefficient Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

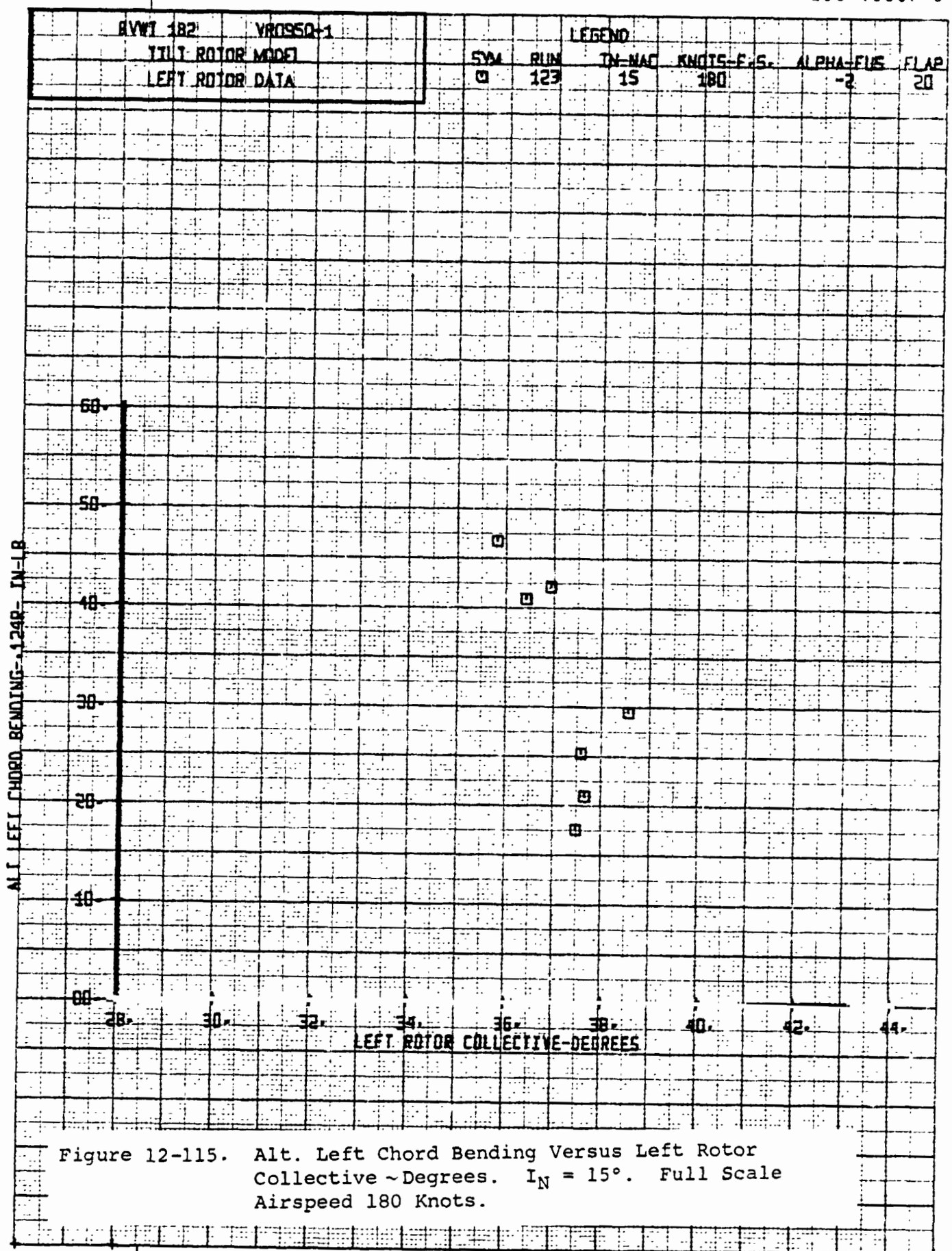


Figure 12-115. Alt. Left Chord Bending Versus Left Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

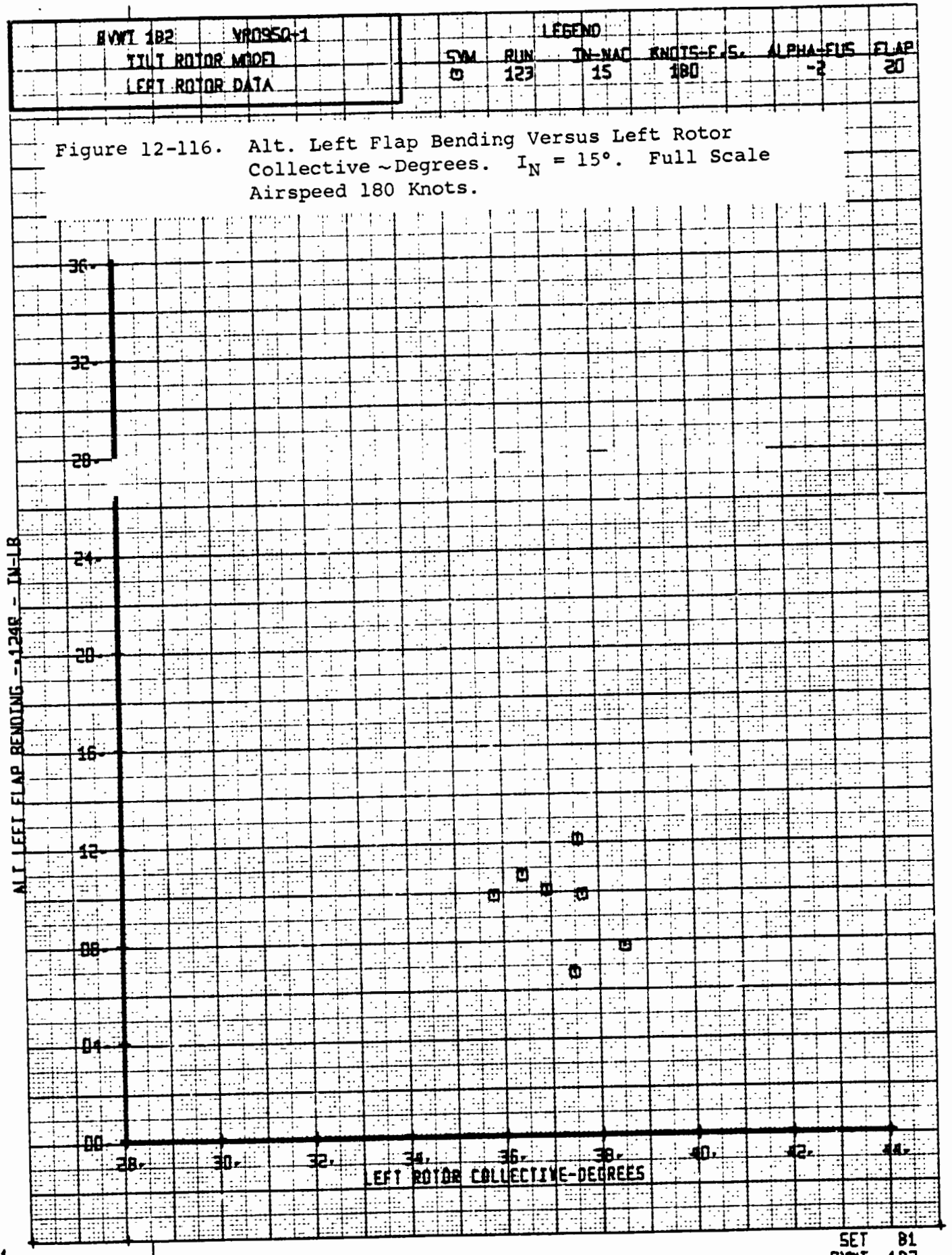


Figure 12-116. Alt. Left Flap Bending Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

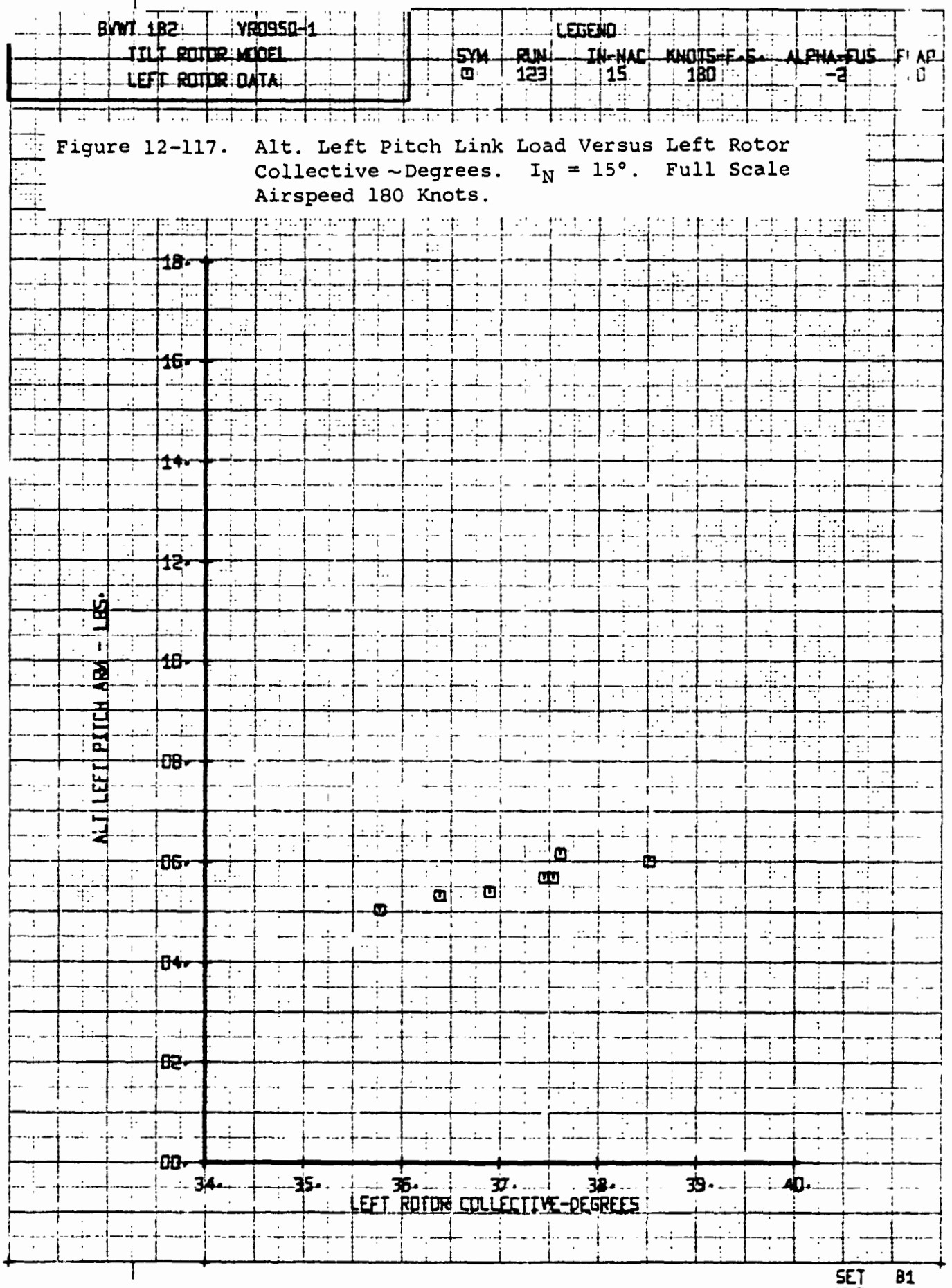


Figure 12-117. Alt. Left Pitch Link Load Versus Left Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

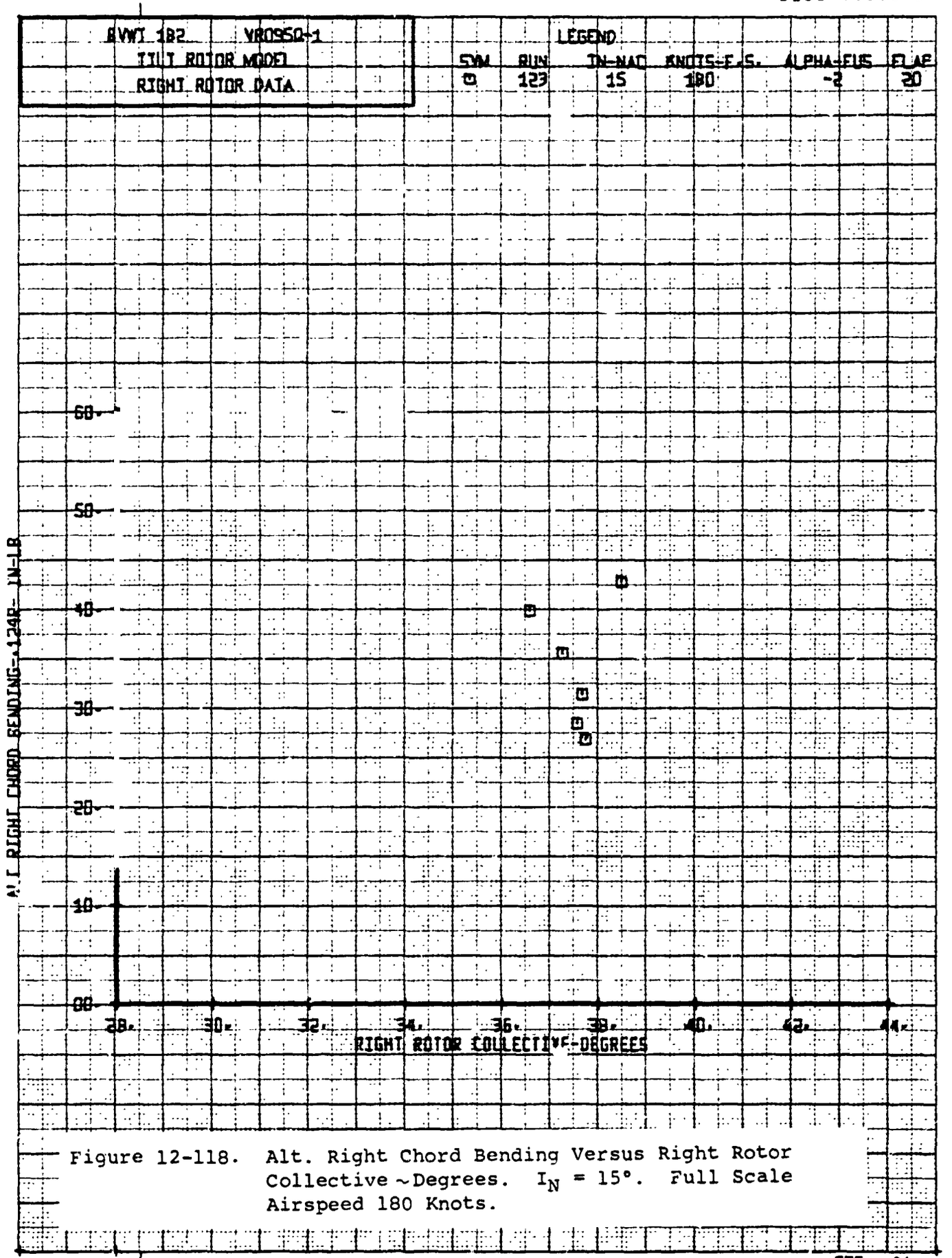


Figure 12-118. Alt. Right Chord Bending Versus Right Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

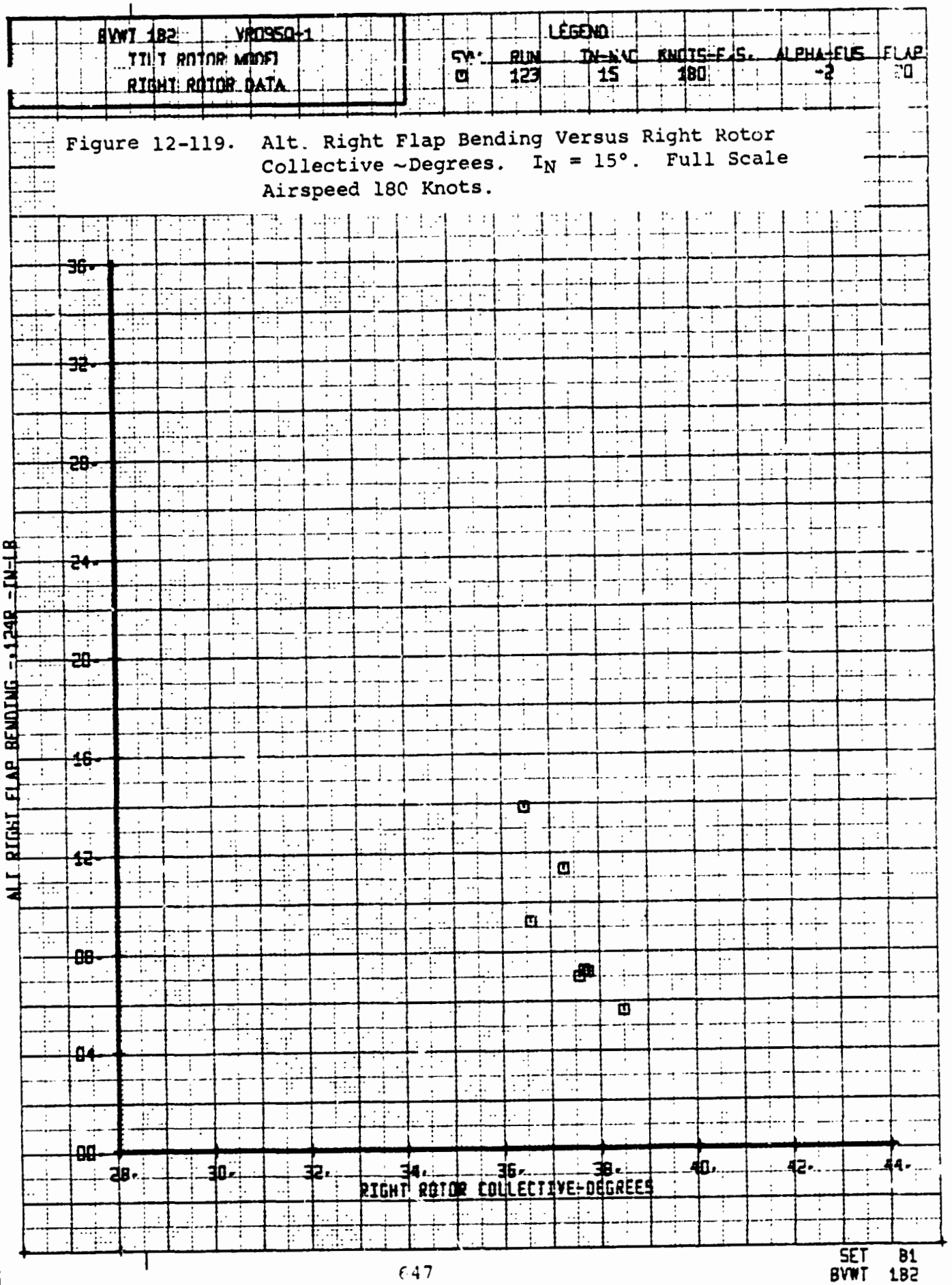


Figure 12-119. Alt. Right Flap Bending Versus Right Rotor Collective ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

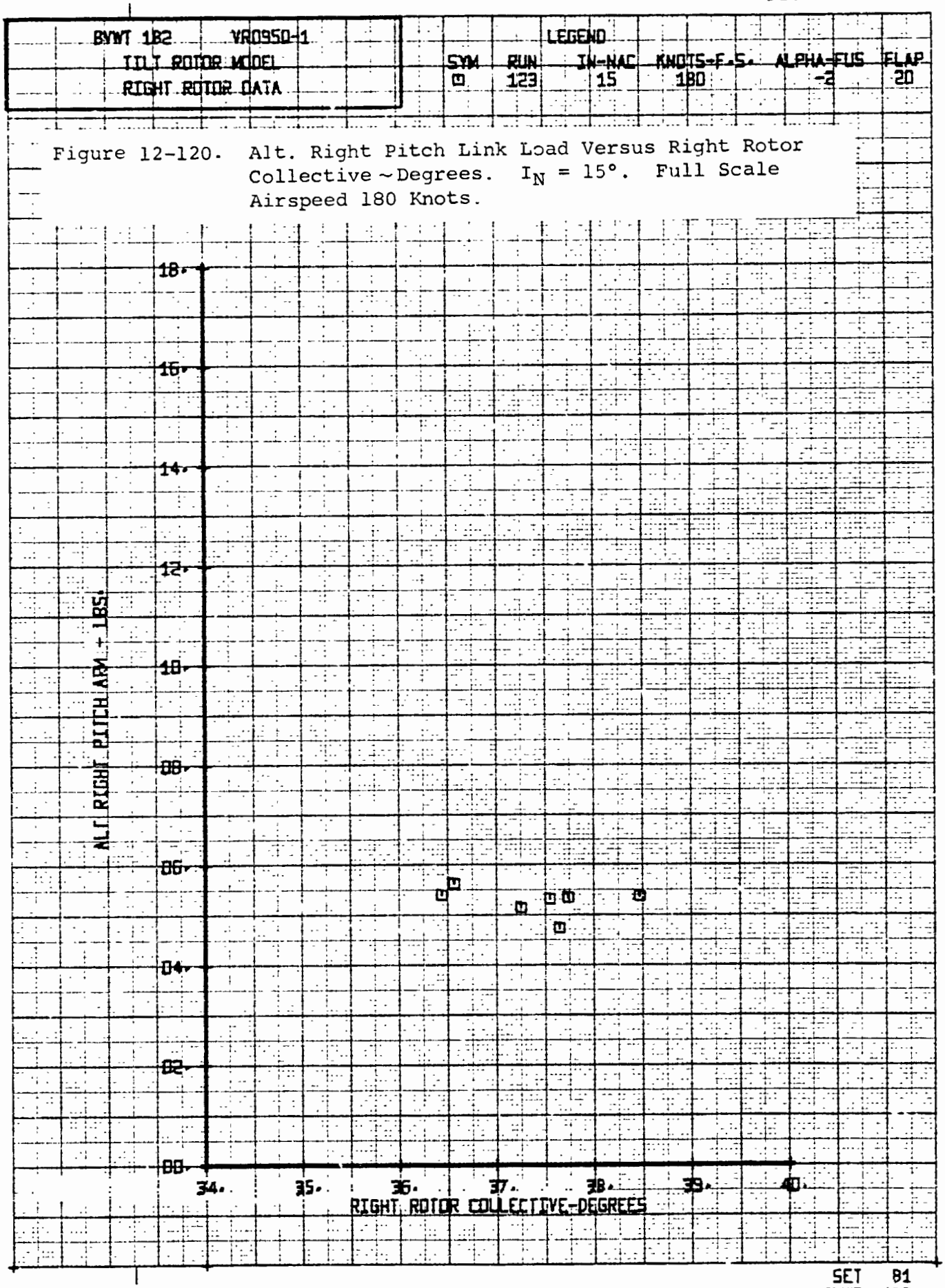


Figure 12-120. Alt. Right Pitch Link Load Versus Right Rotor Collective ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

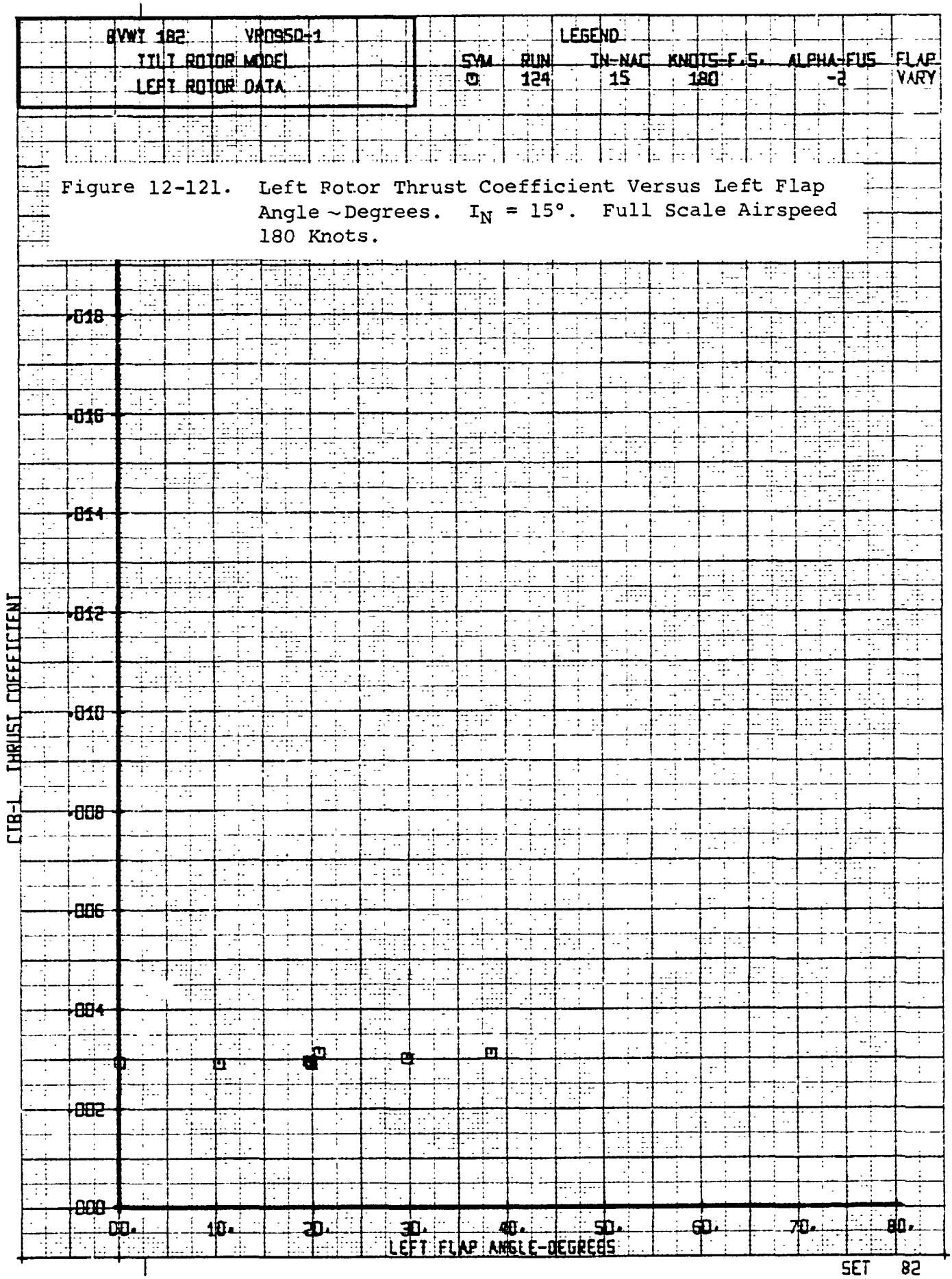


Figure 12-121. Left Rotor Thrust Coefficient Versus Left Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

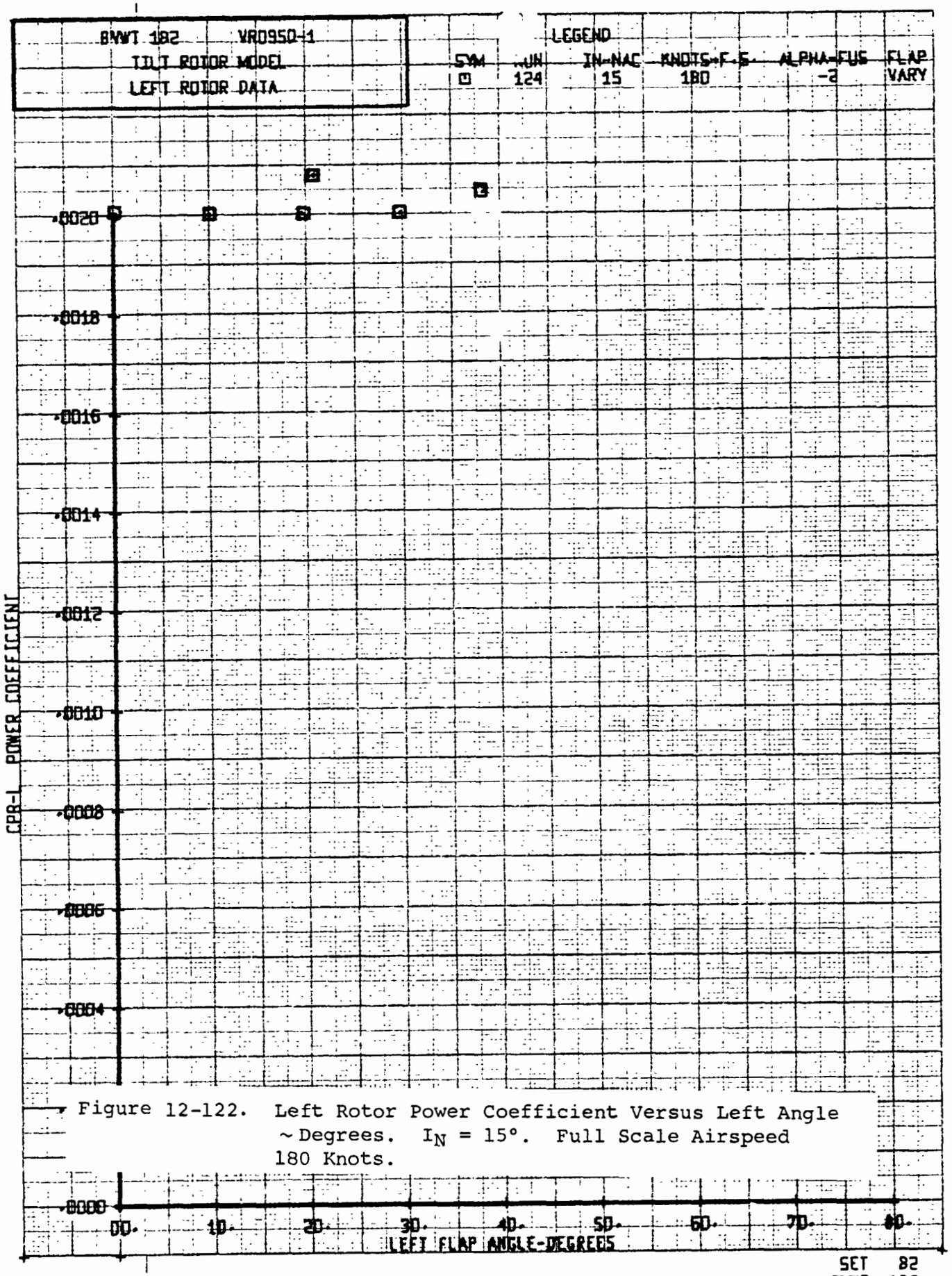


Figure 12-122. Left Rotor Power Coefficient Versus Left Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

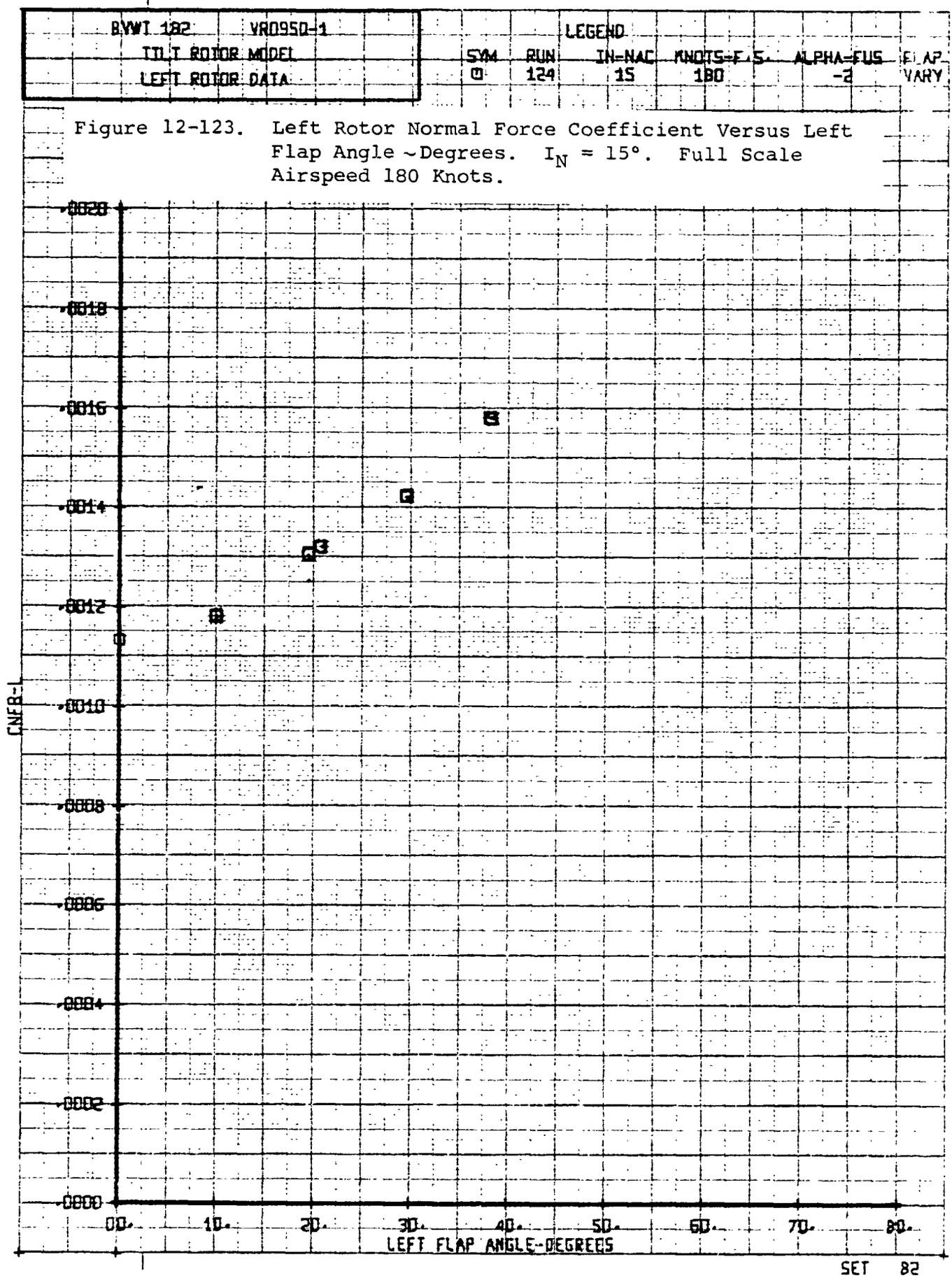


Figure 12-123. Left Rotor Normal Force Coefficient Versus Left Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

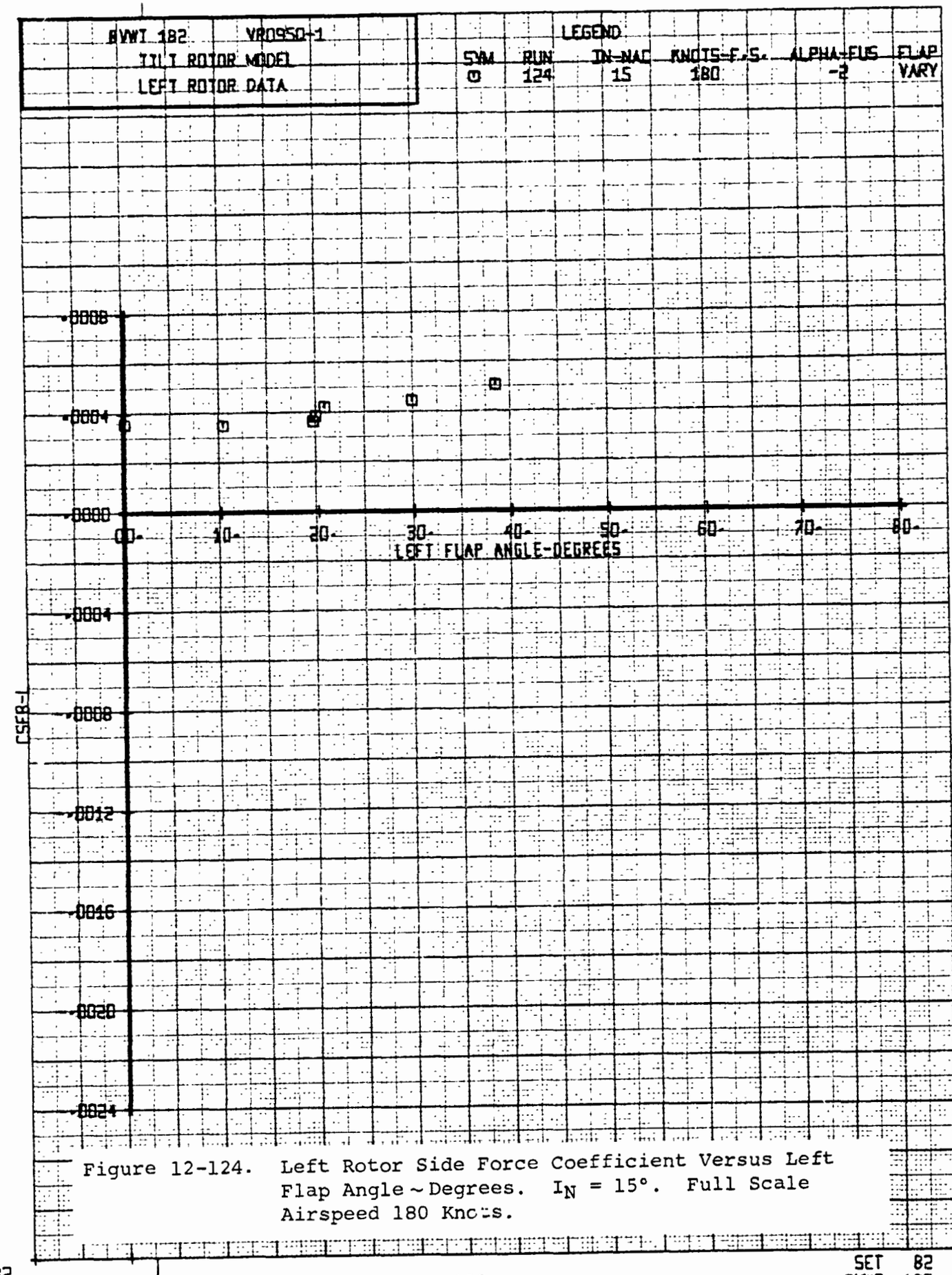


Figure 12-124. Left Rotor Side Force Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

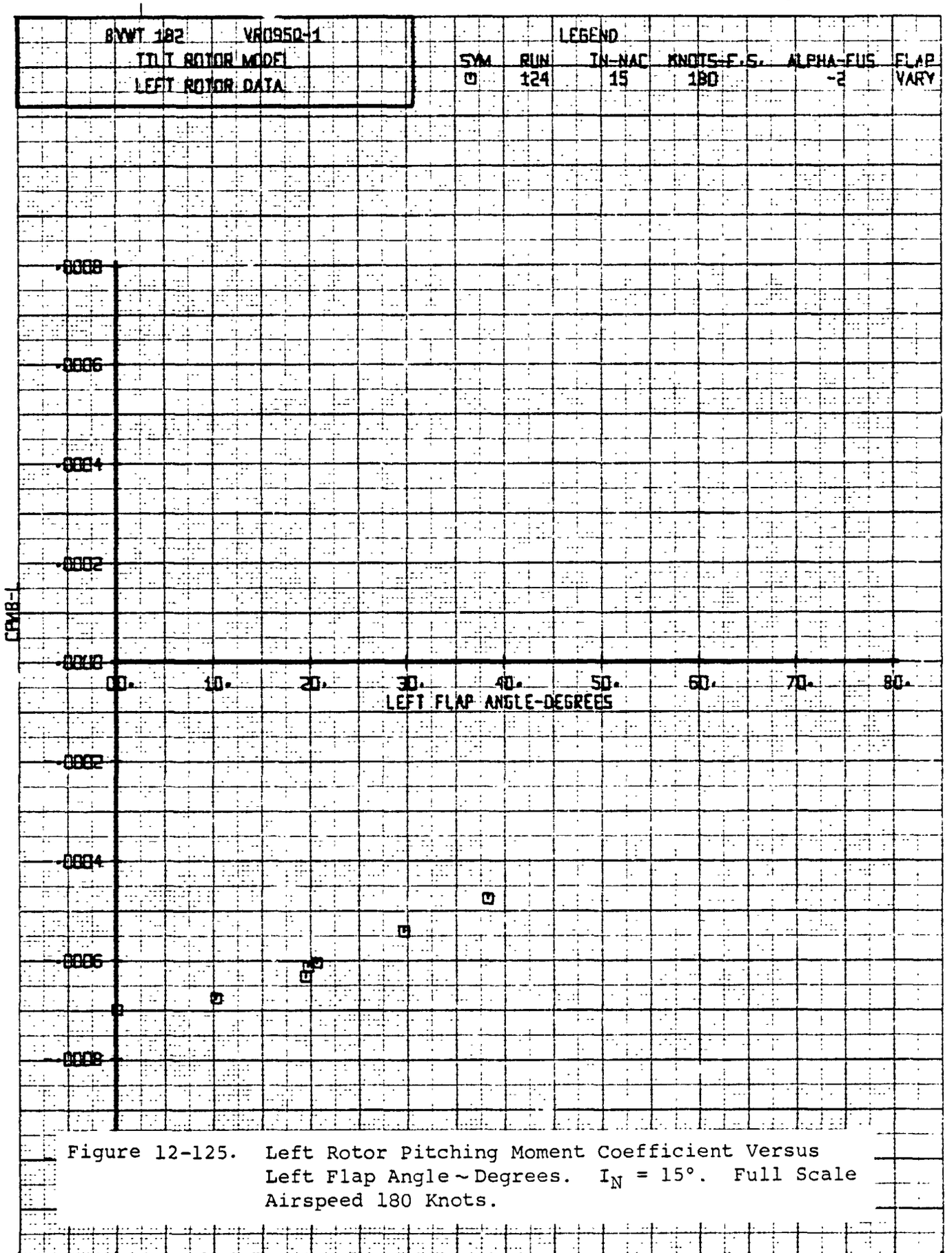


Figure 12-125. Left Rotor Pitching Moment Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

FT 82
182

SET 82
BVWT 182

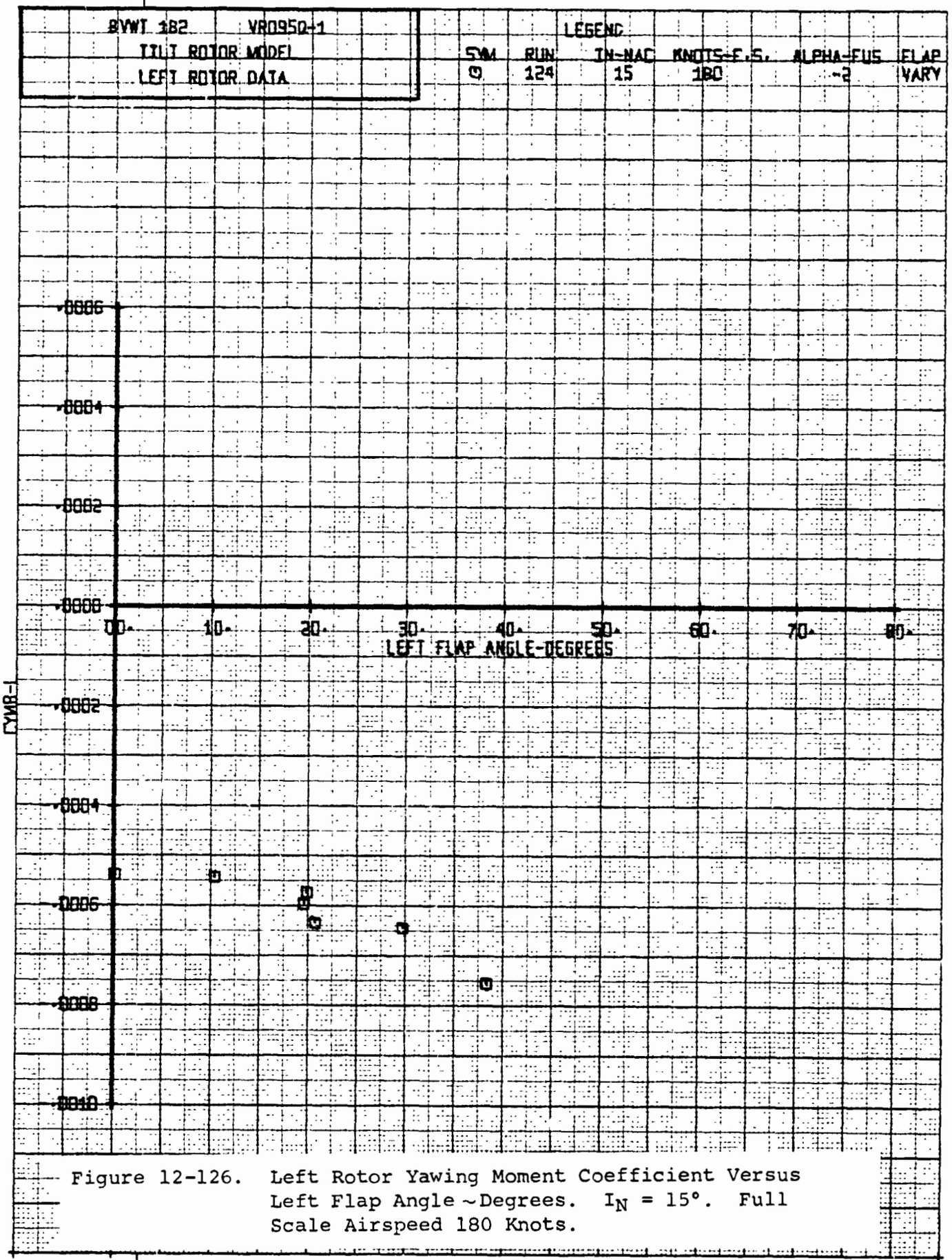


Figure 12-126. Left Rotor Yawing Moment Coefficient Versus Left Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

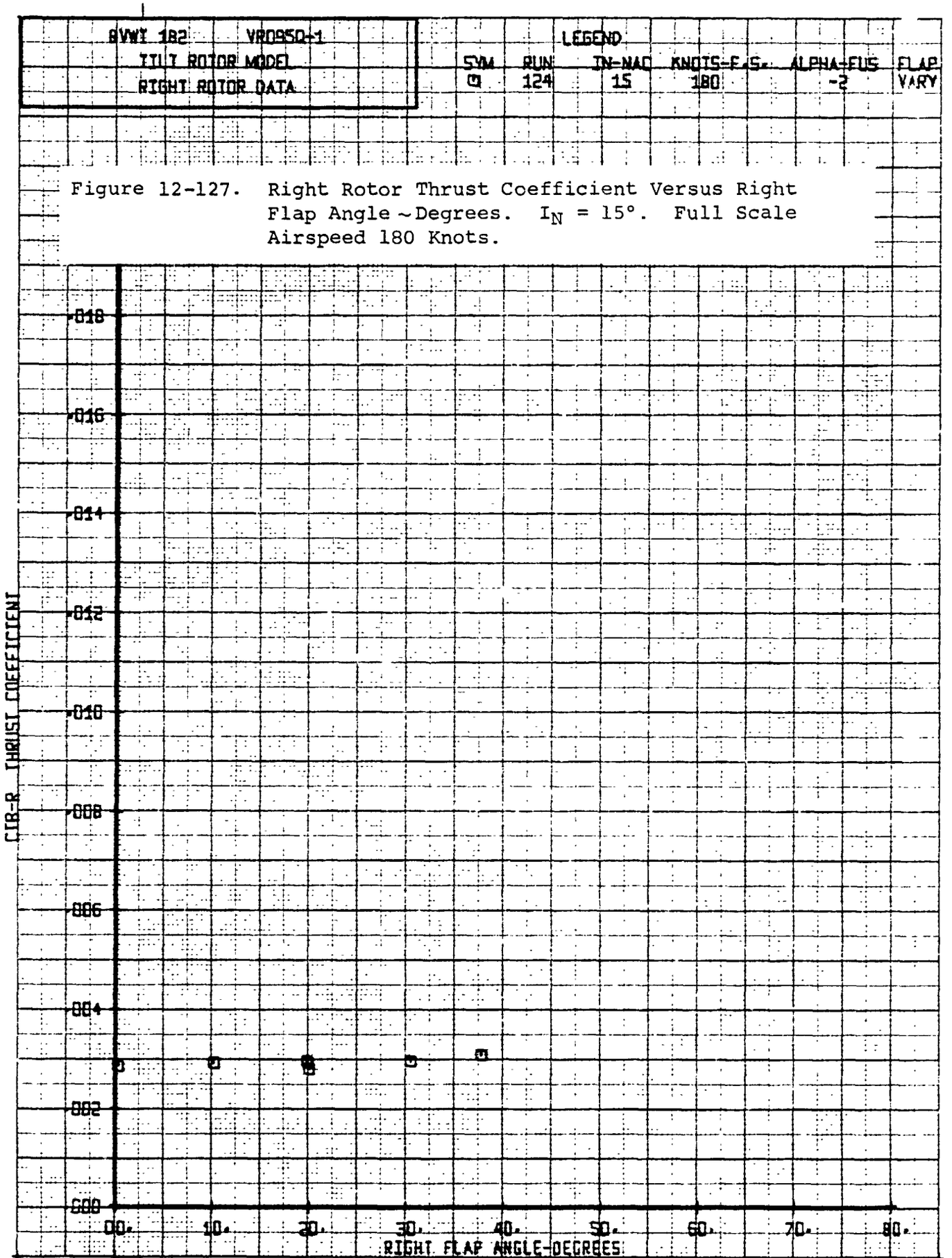


Figure 12-127. Right Rotor Thrust Coefficient Versus Right Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

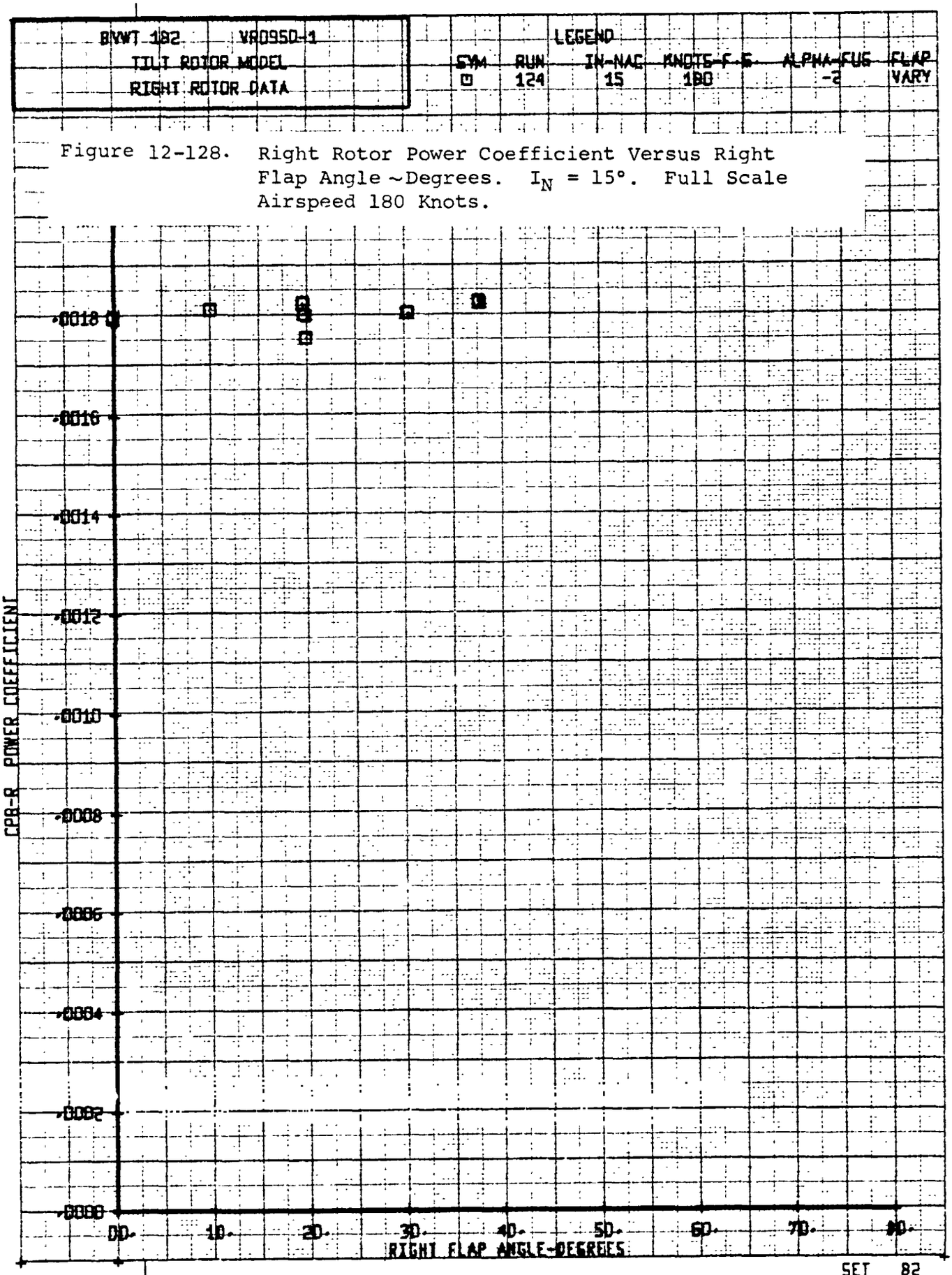


Figure 12-128. Right Rotor Power Coefficient Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

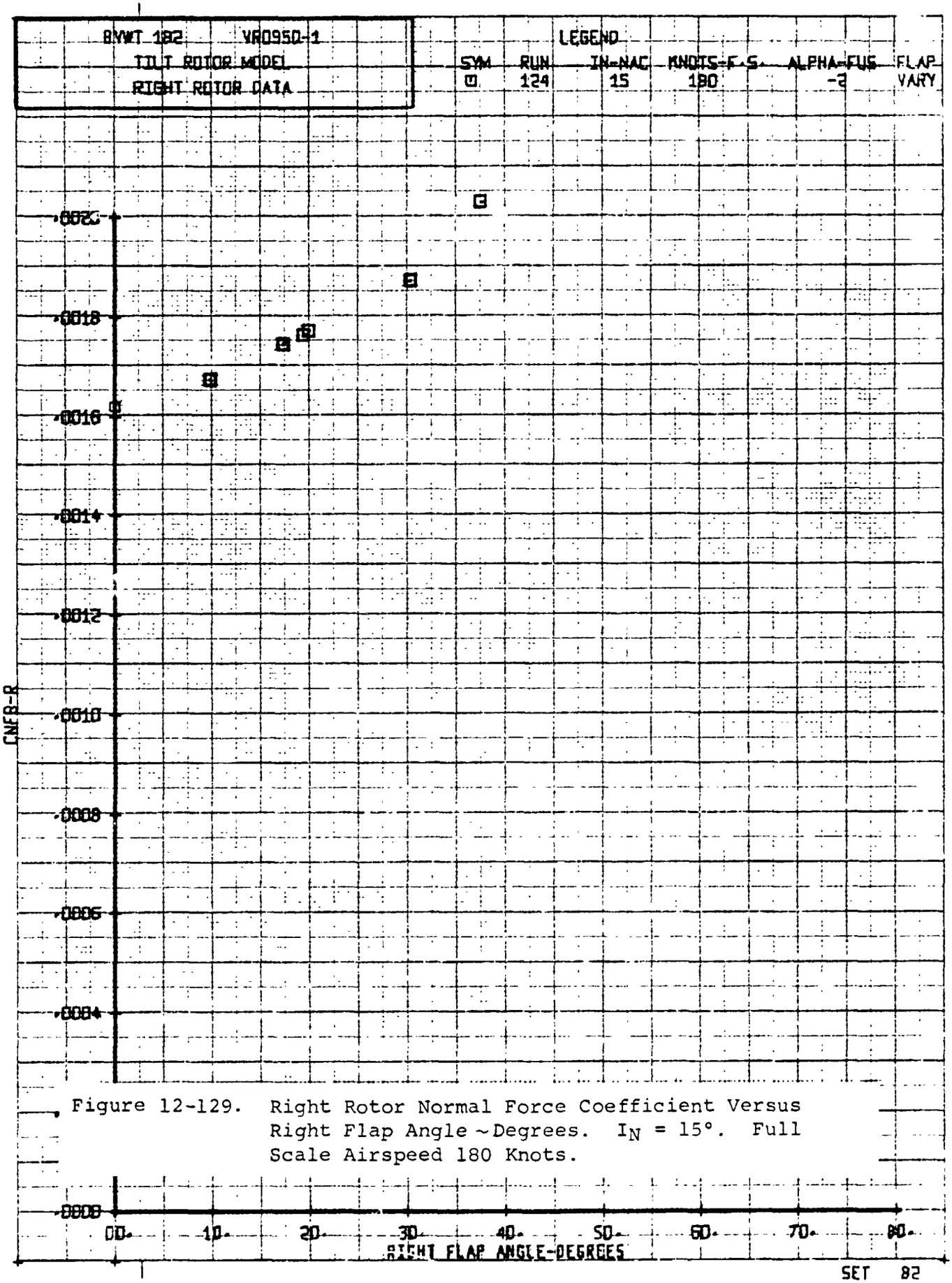


Figure 12-129. Right Rotor Normal Force Coefficient Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

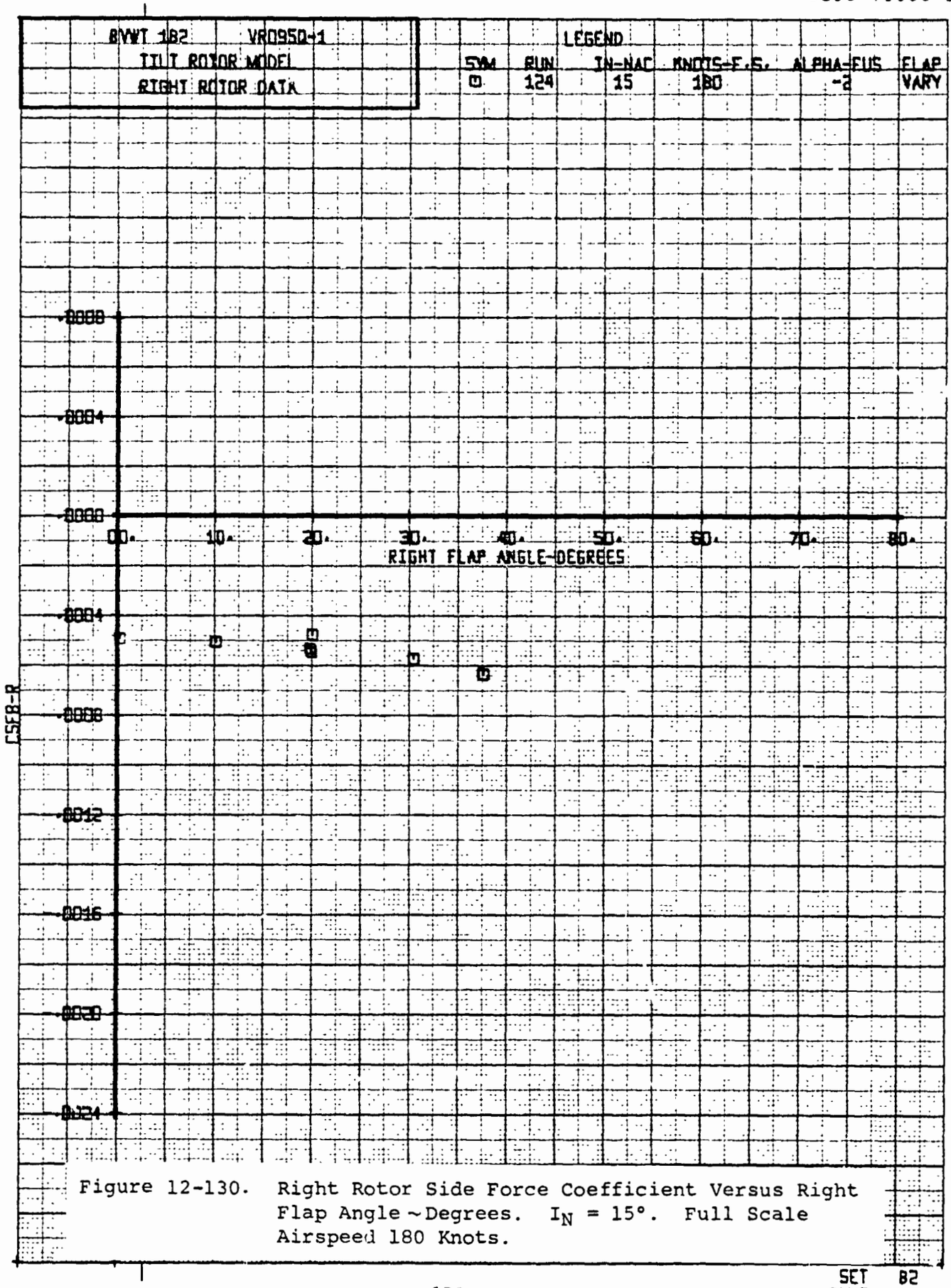


Figure 12-130. Right Rotor Side Force Coefficient Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

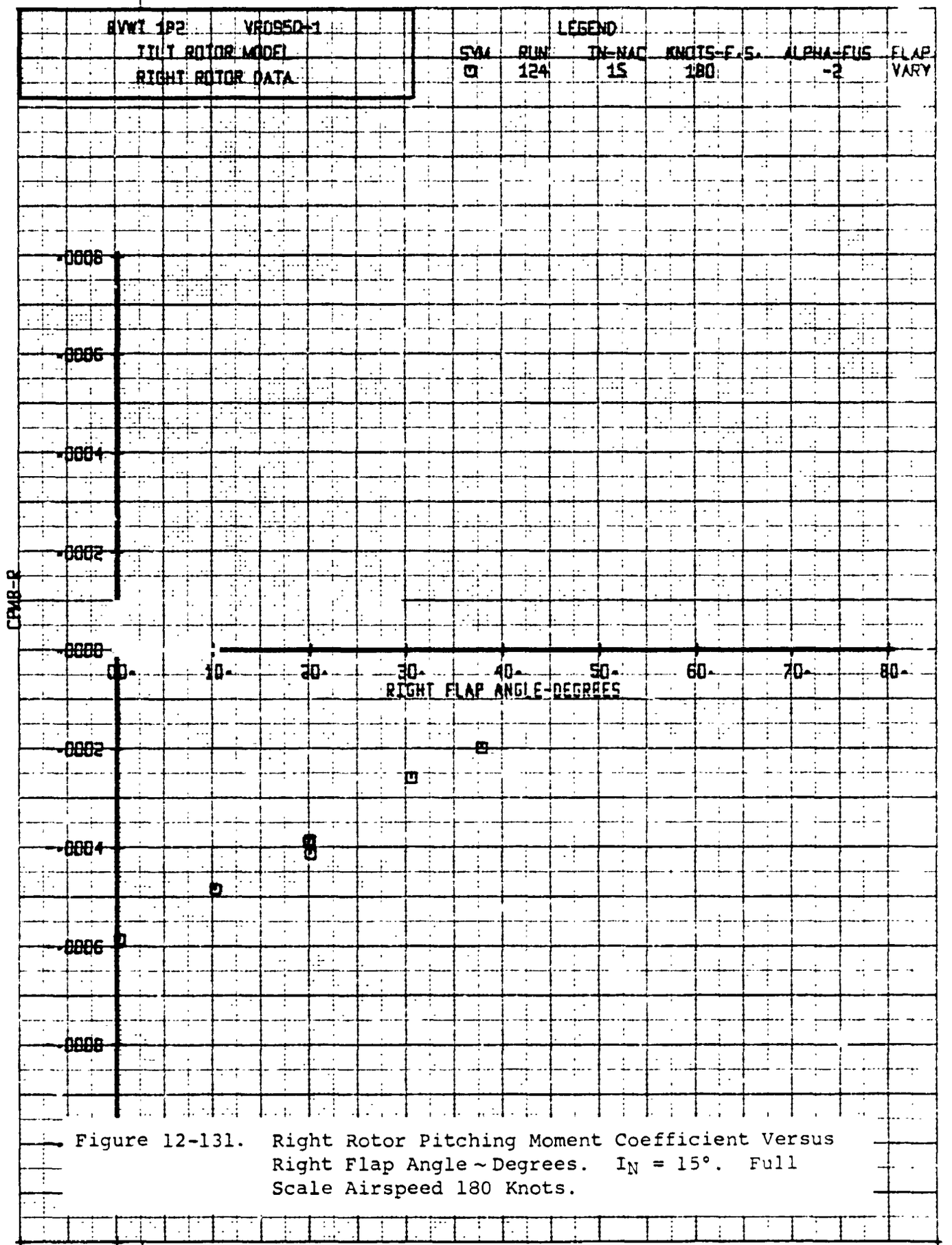


Figure 12-131. Right Rotor Pitching Moment Coefficient Versus Right Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

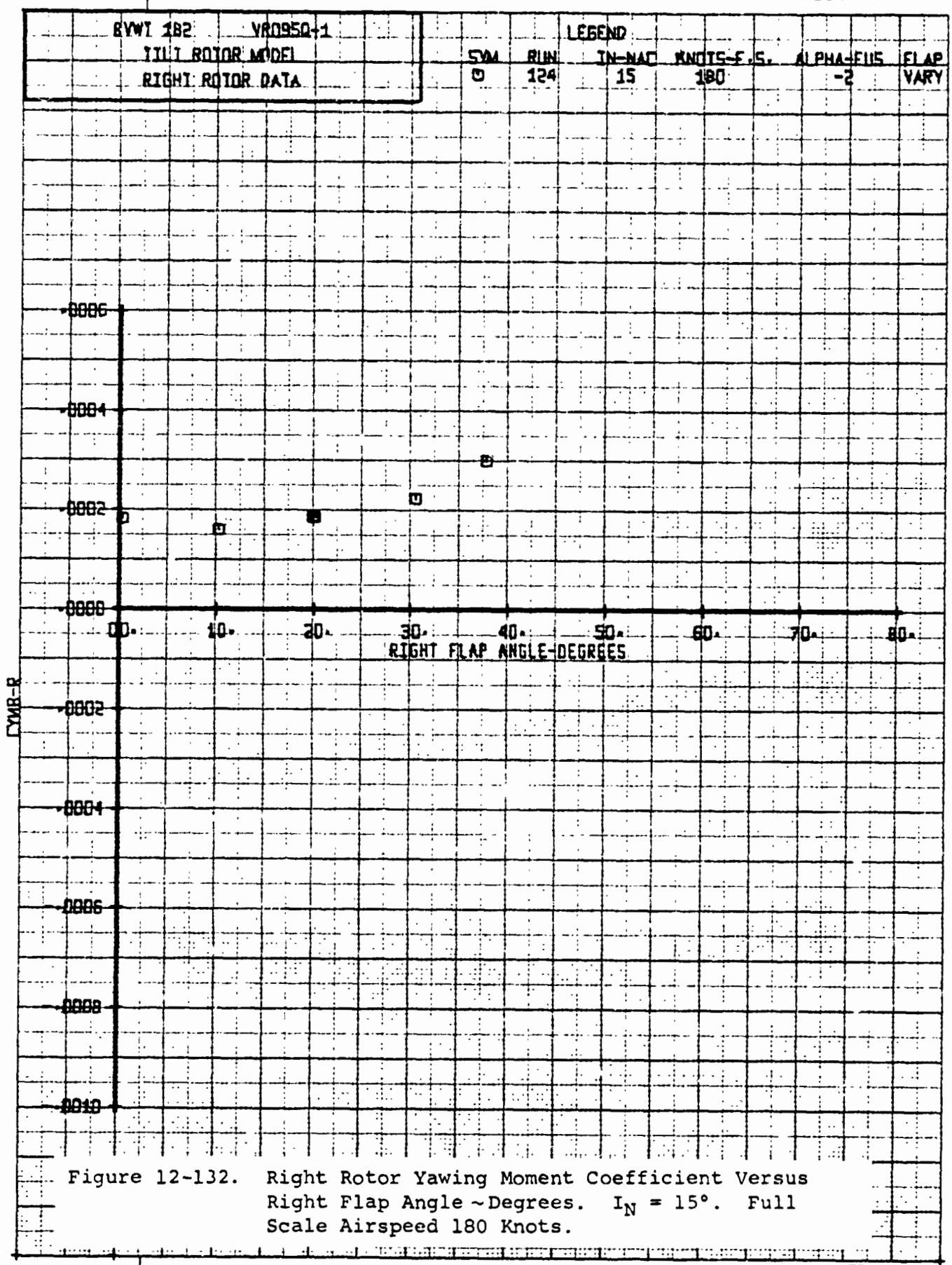


Figure 12-132. Right Rotor Yawing Moment Coefficient Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

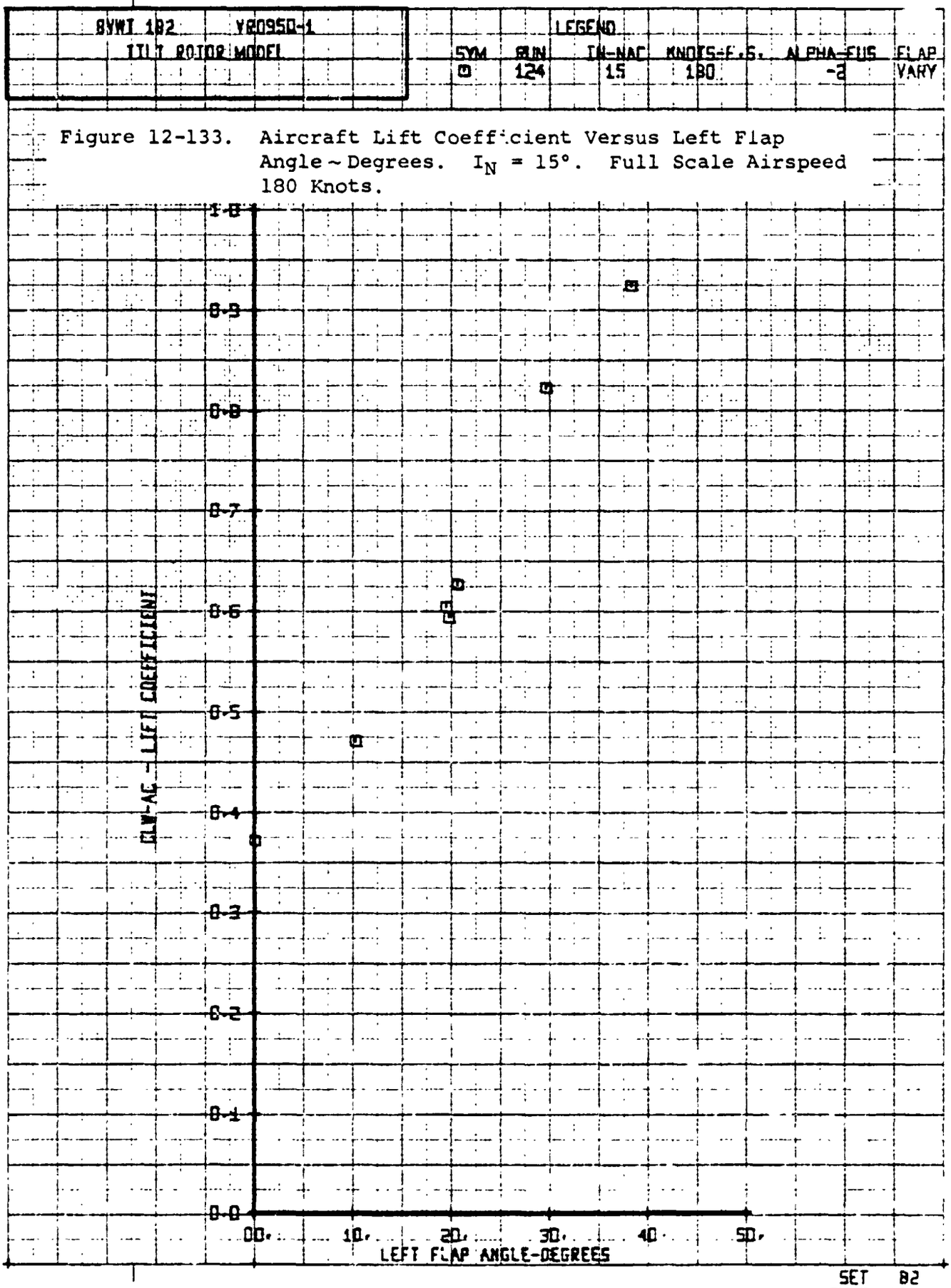


Figure 12-133. Aircraft Lift Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

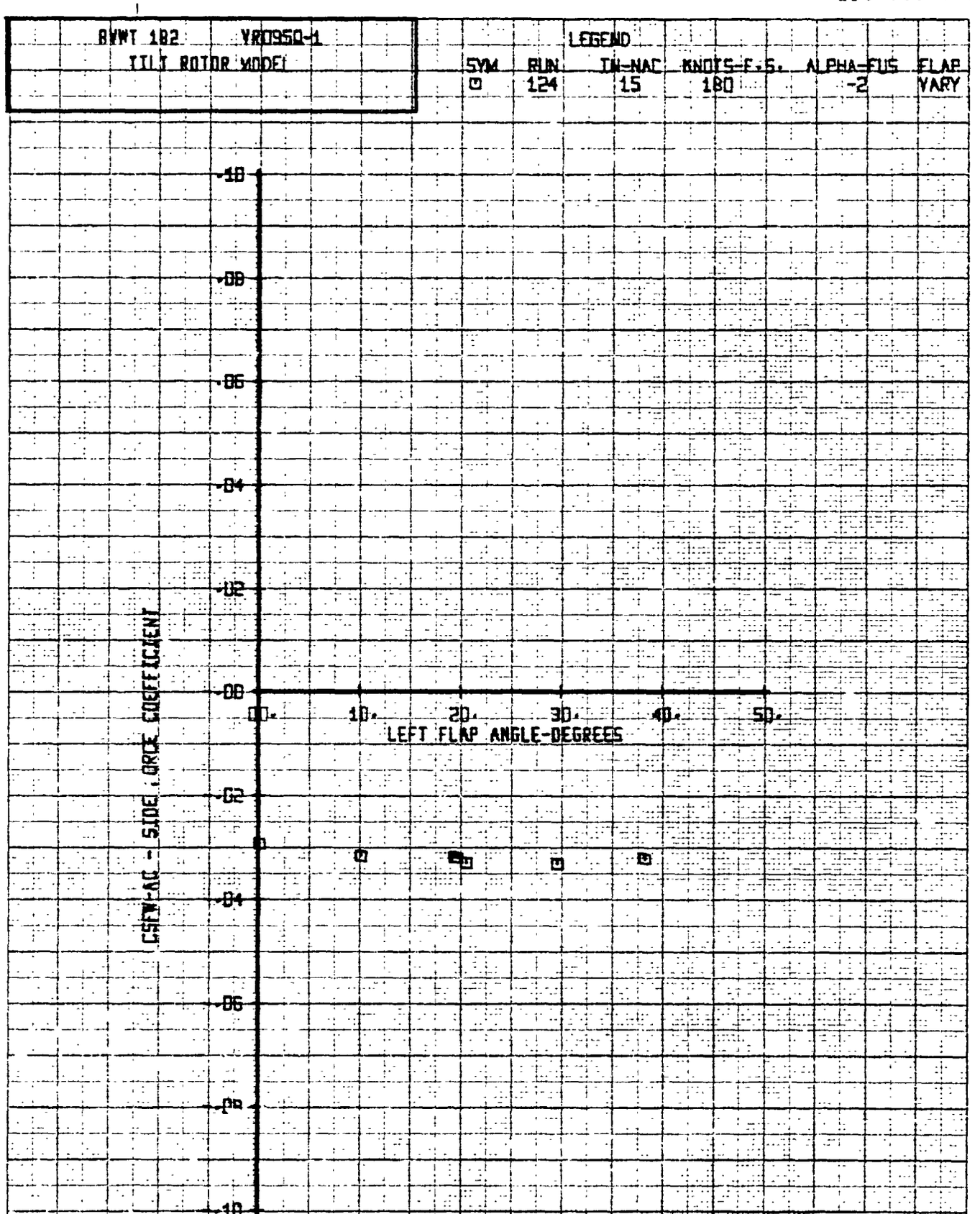


Figure 12-134. Aircraft Side Force Coefficient Versus Left Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

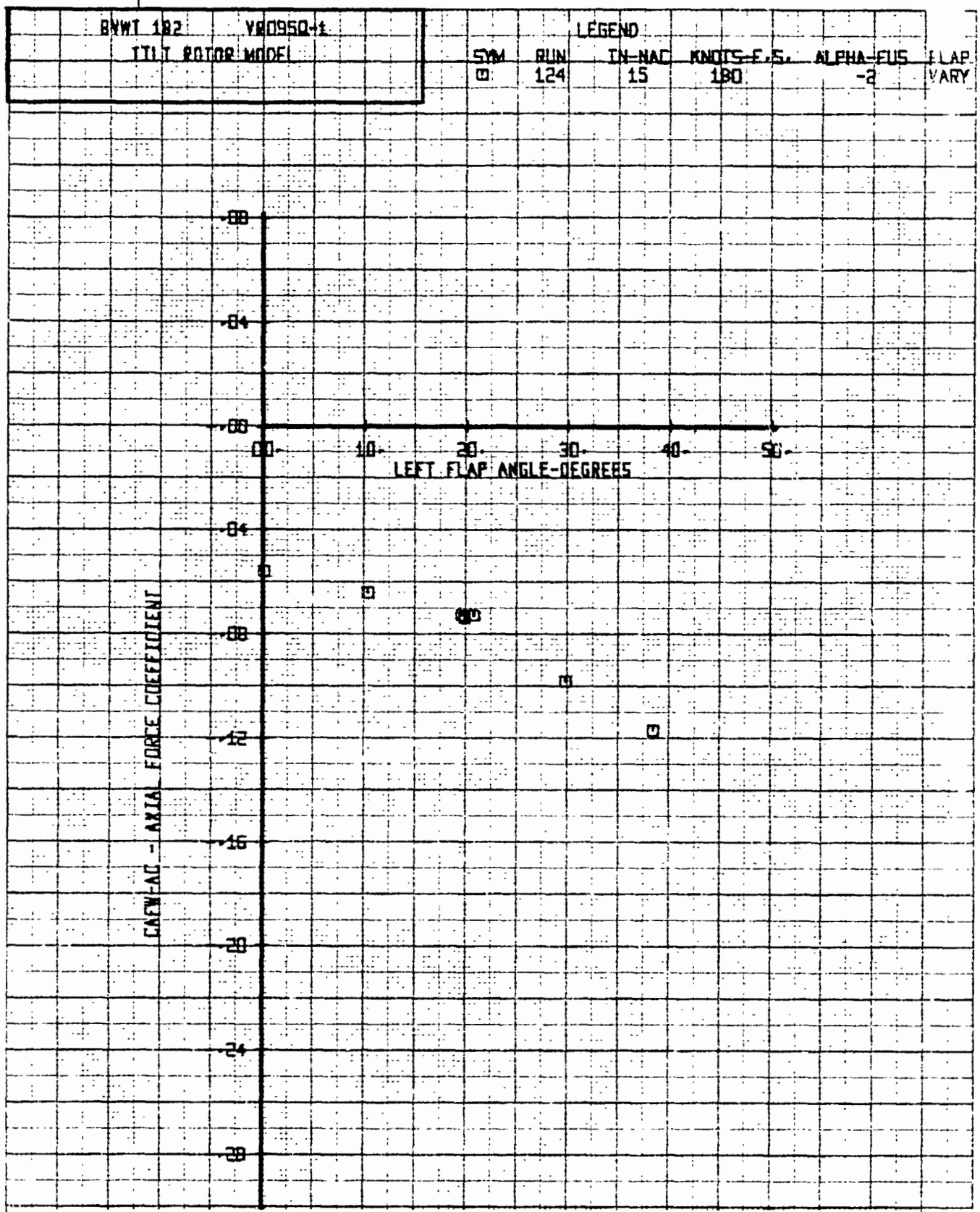


Figure 12-135. Aircraft Axial Force Coefficient Versus Left Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

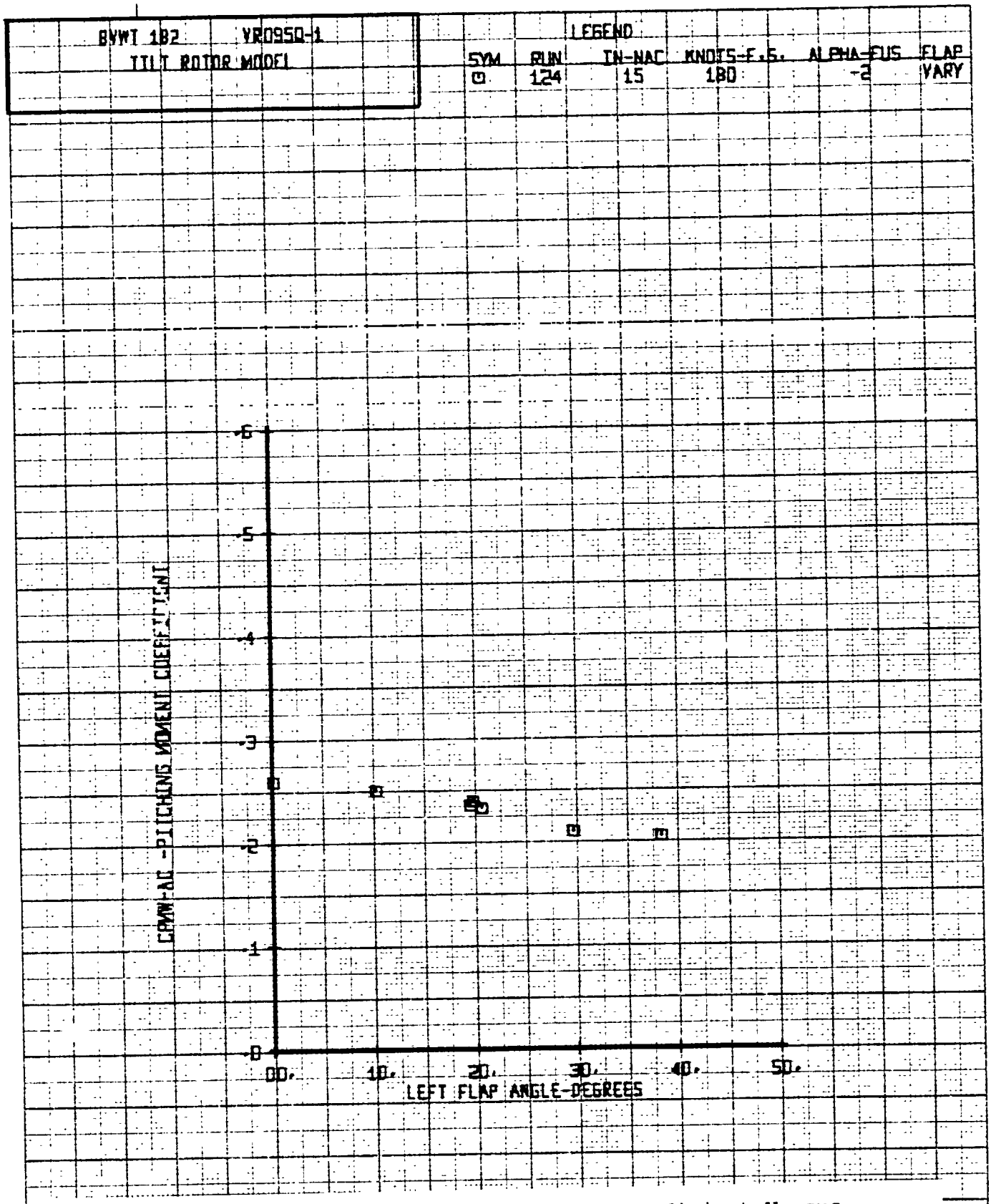


Figure 12-136. Aircraft Pitching Moment Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

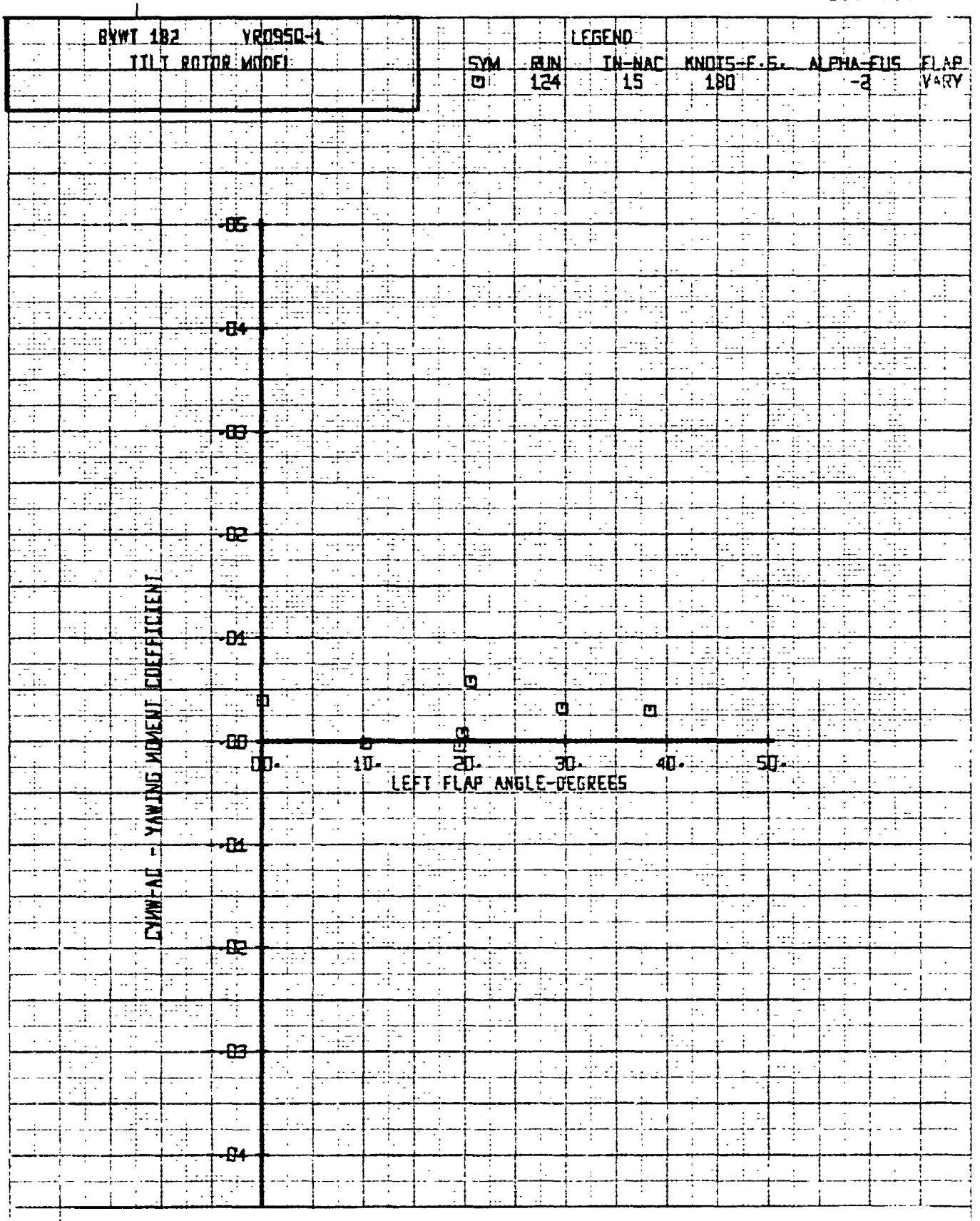


Figure 12-137. Aircraft Yawing Moment Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

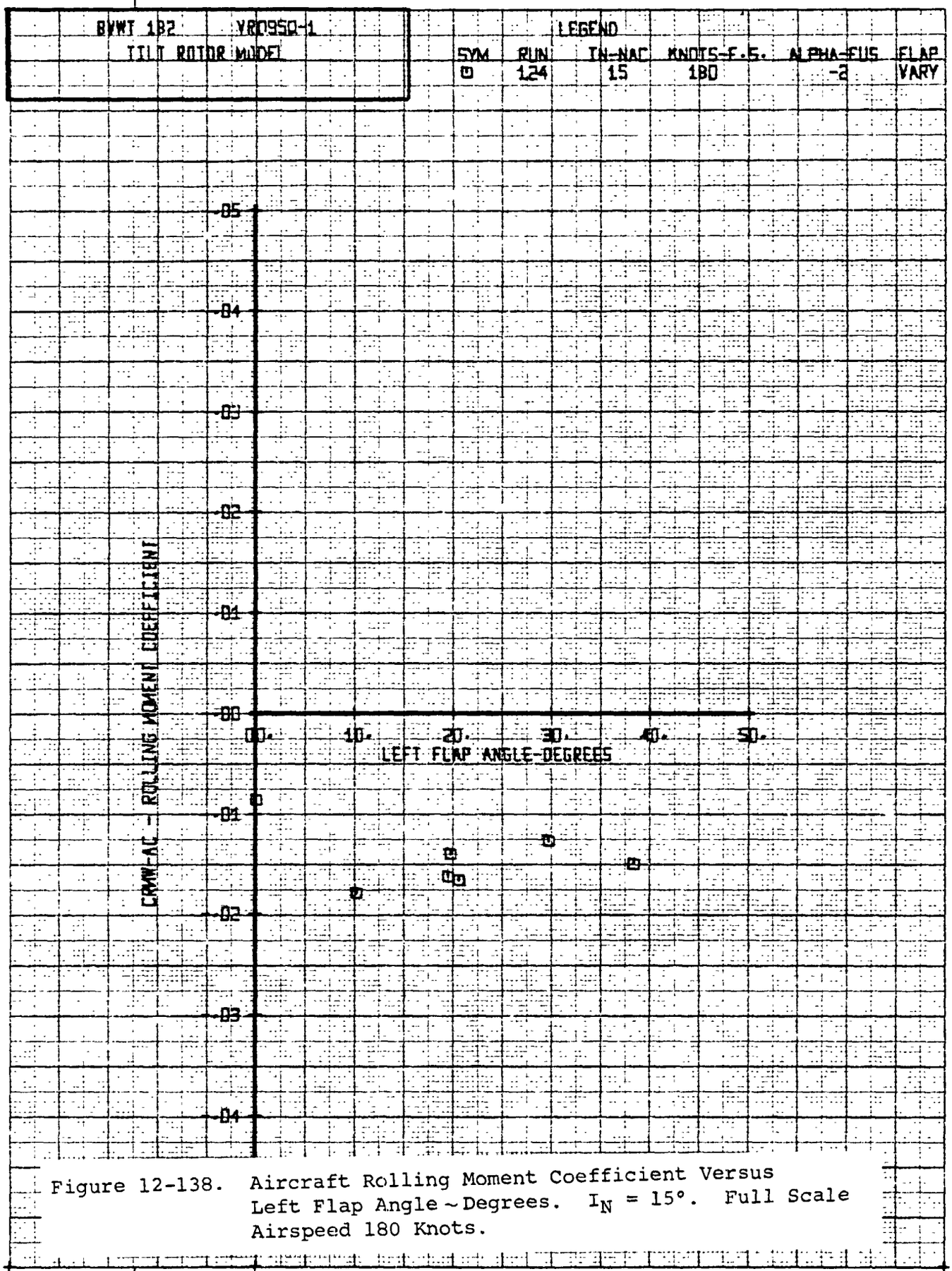


Figure 12-138. Aircraft Rolling Moment Coefficient Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

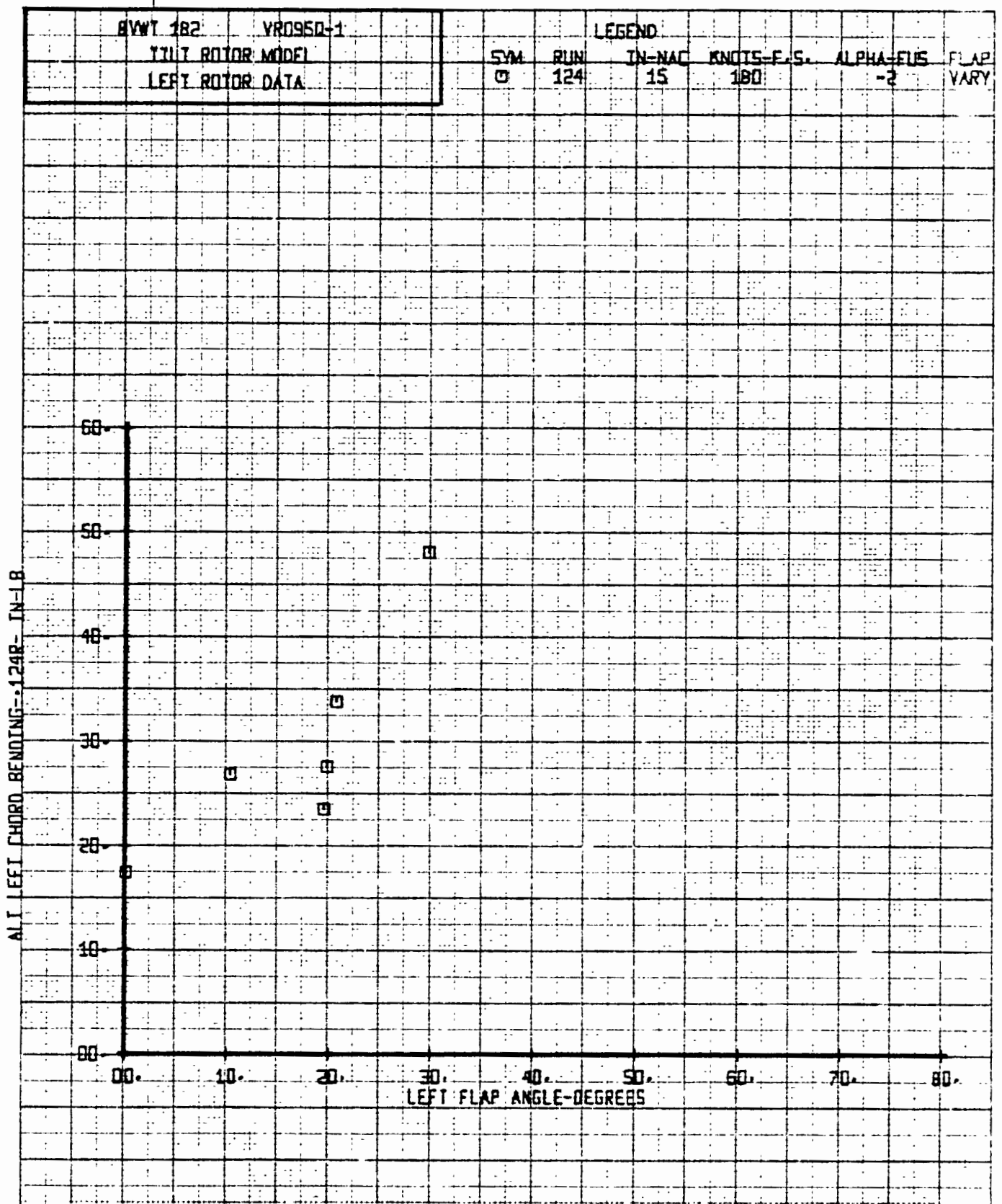


Figure 12-139. Alt. Left Chord Bending Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

FT 82
182

SET 82
BVWT 182

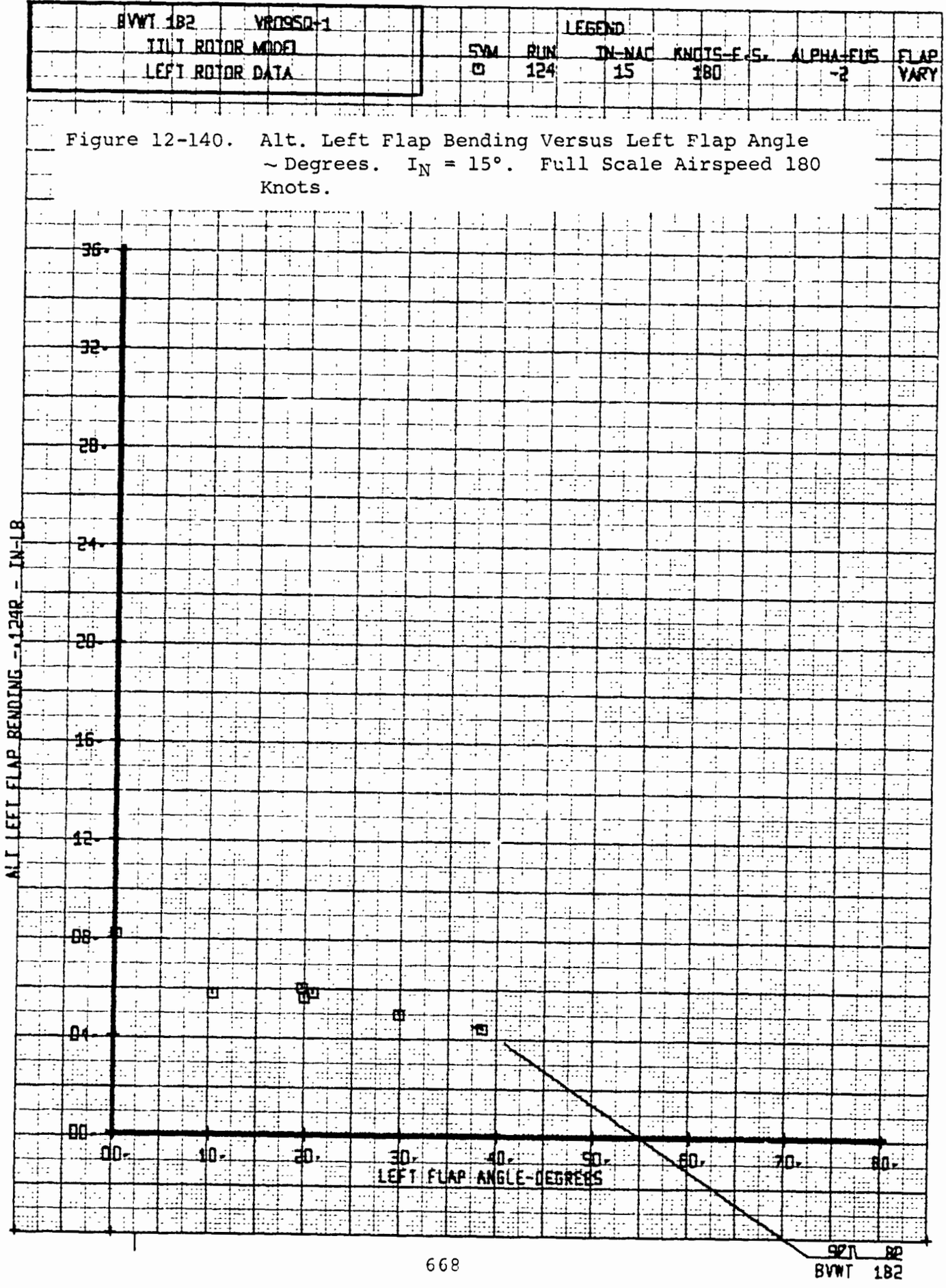


Figure 12-140. Alt. Left Flap Bending Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

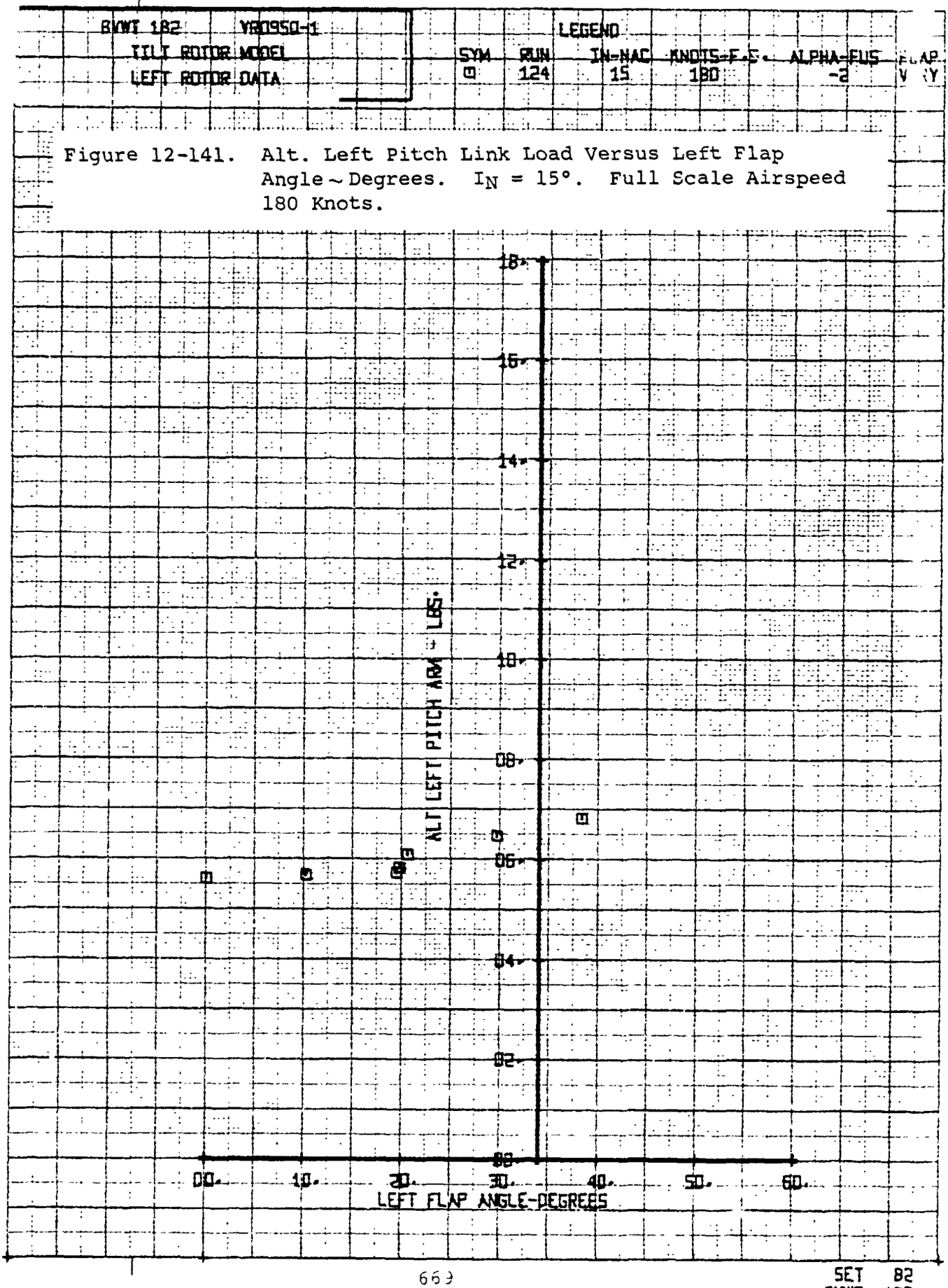


Figure 12-141. Alt. Left Pitch Link Load Versus Left Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

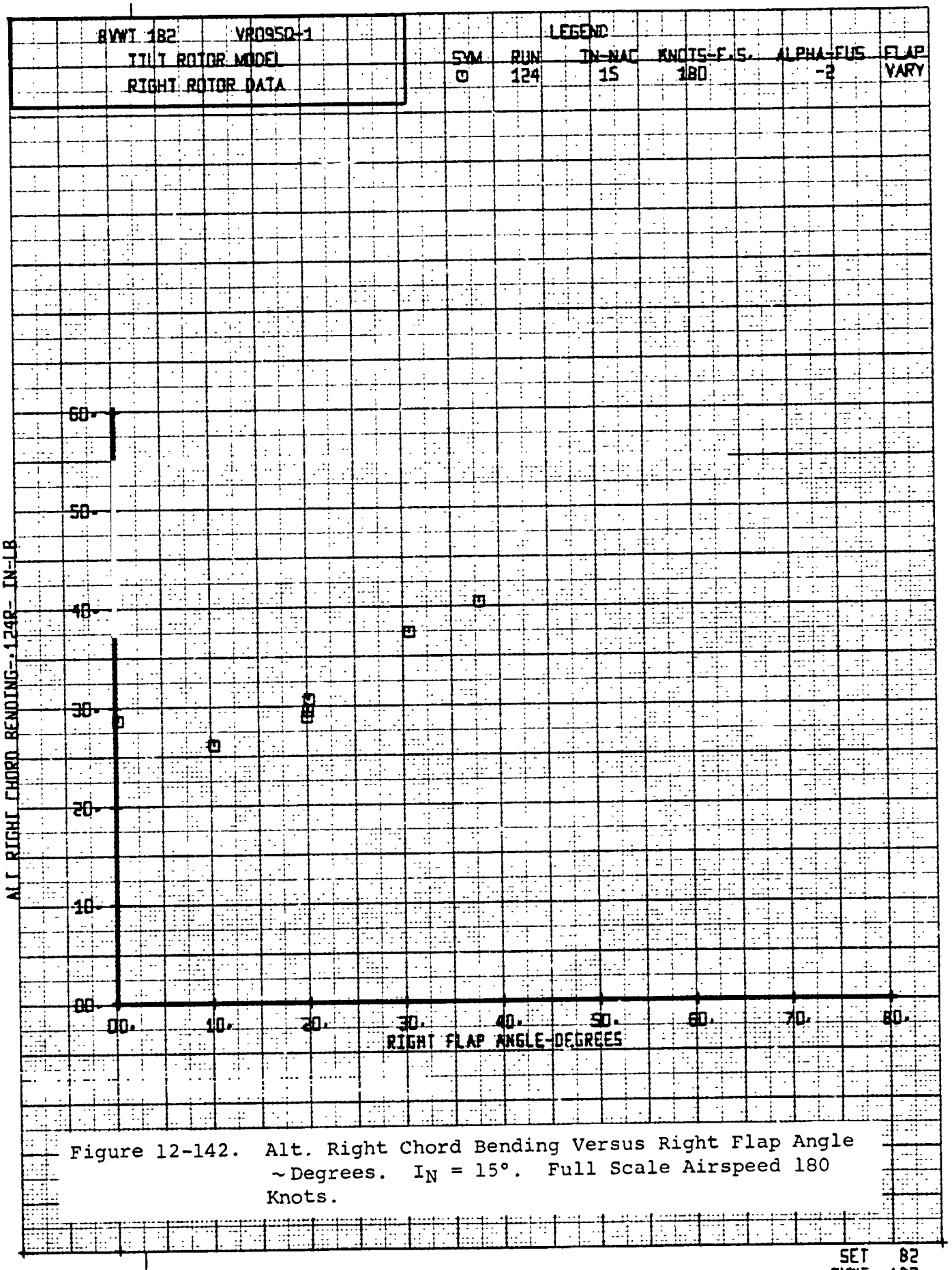


Figure 12-142. Alt. Right Chord Bending Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

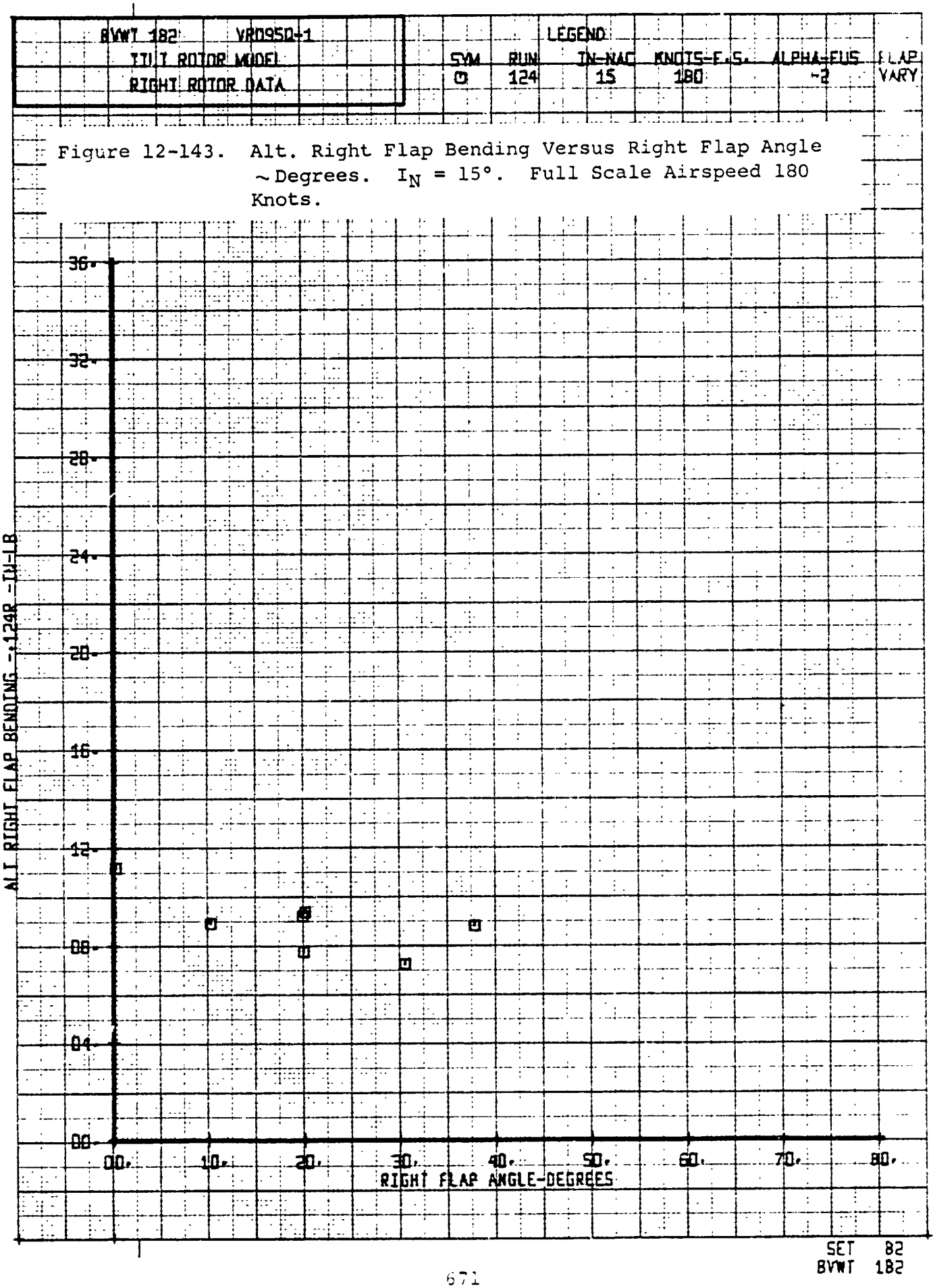


Figure 12-143. Alt. Right Flap Bending Versus Right Flap Angle ~Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

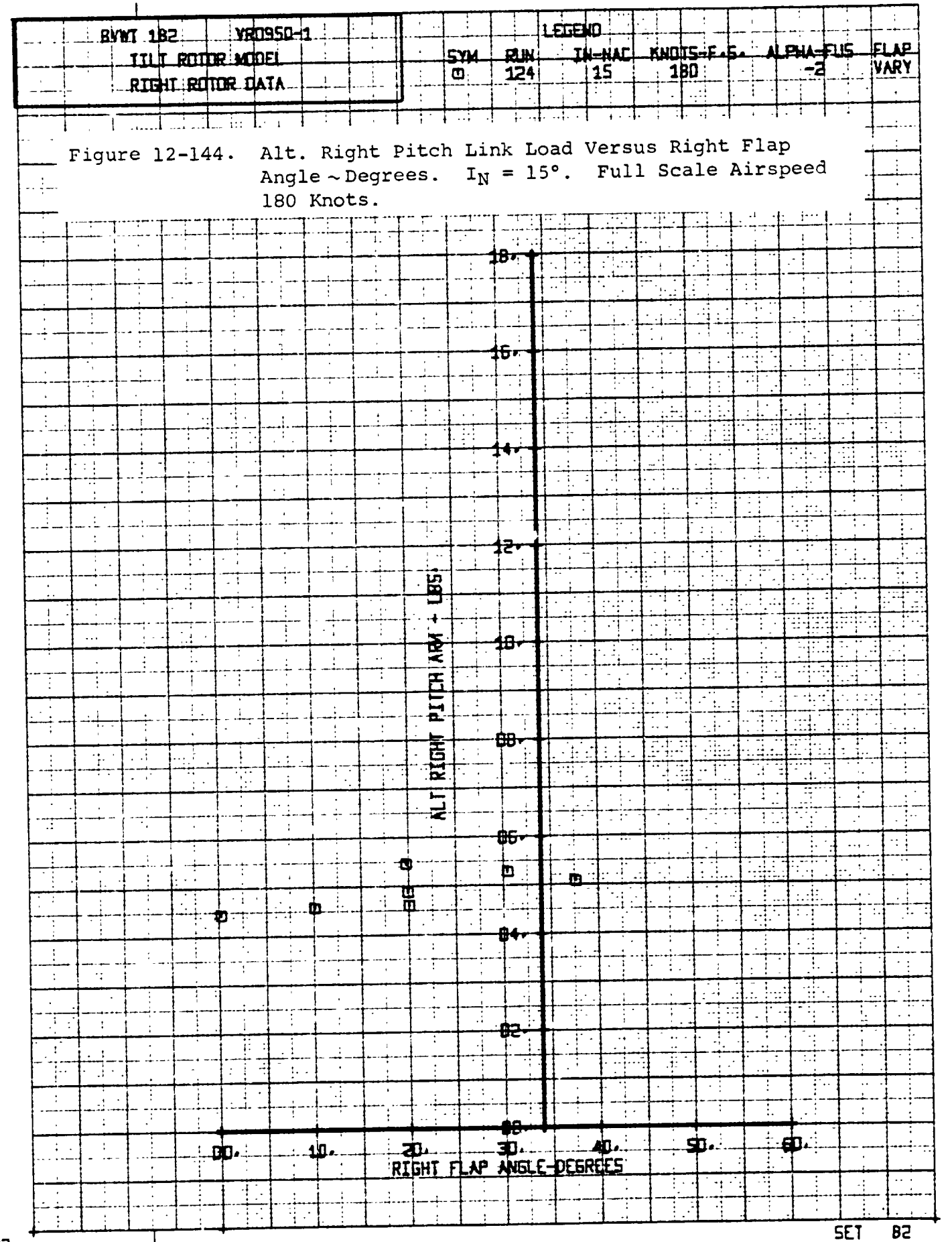


Figure 12-144. Alt. Right Pitch Link Load Versus Right Flap Angle ~ Degrees. I_N = 15°. Full Scale Airspeed 180 Knots.

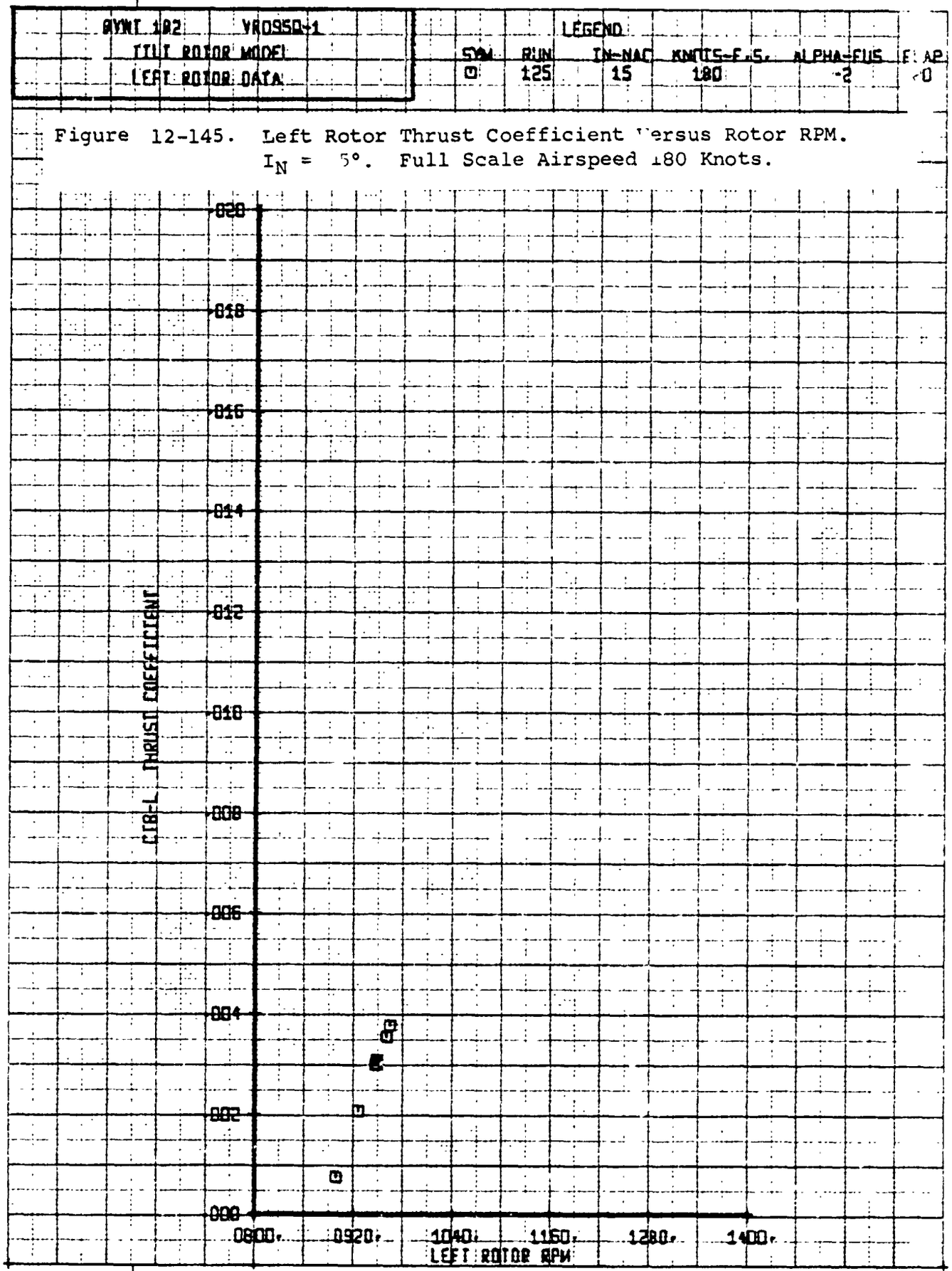


Figure 12-145. Left Rotor Thrust Coefficient versus Rotor RPM. I_N = 5°. Full Scale Airspeed 180 Knots.

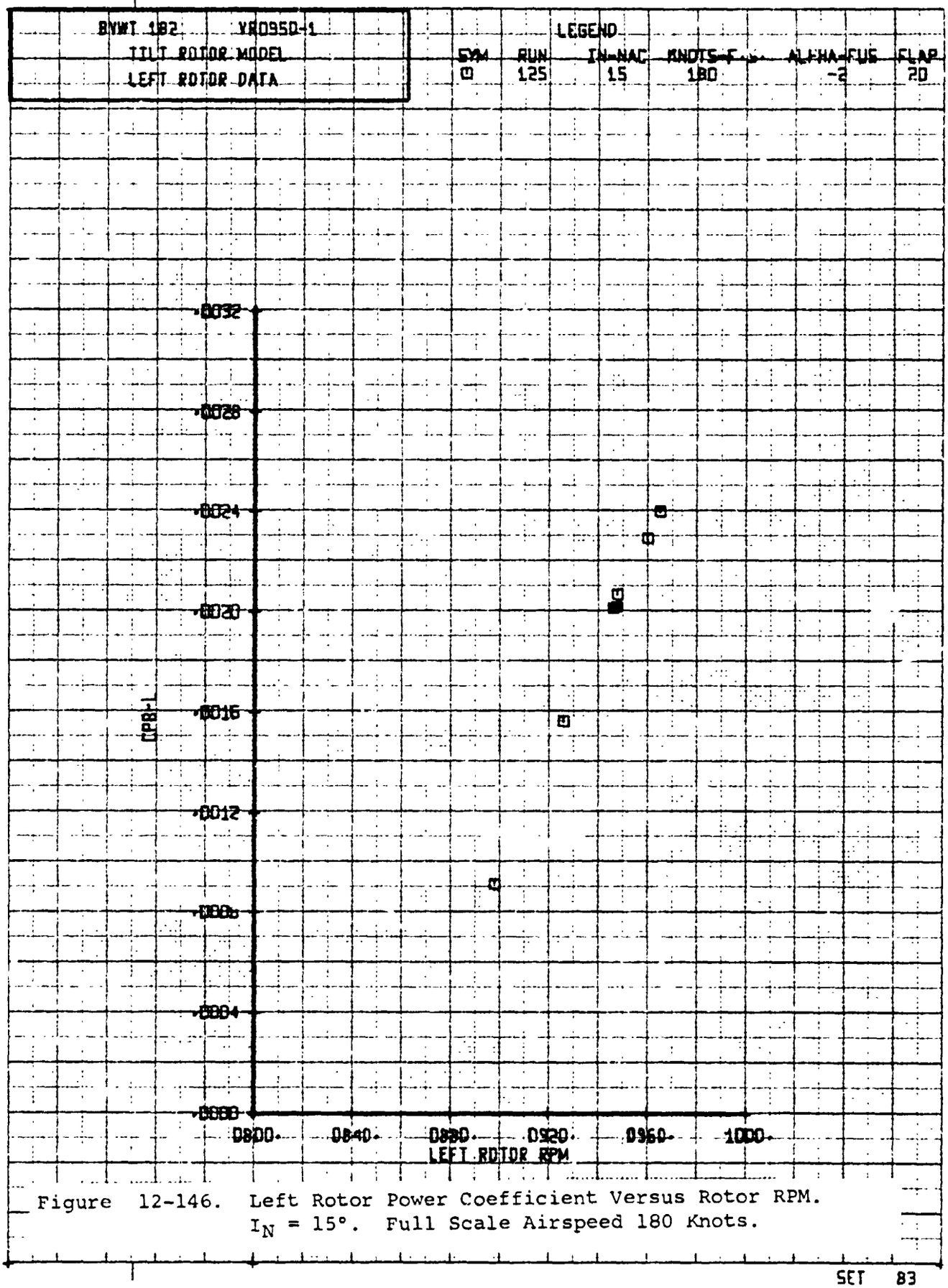


Figure 12-146. Left Rotor Power Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

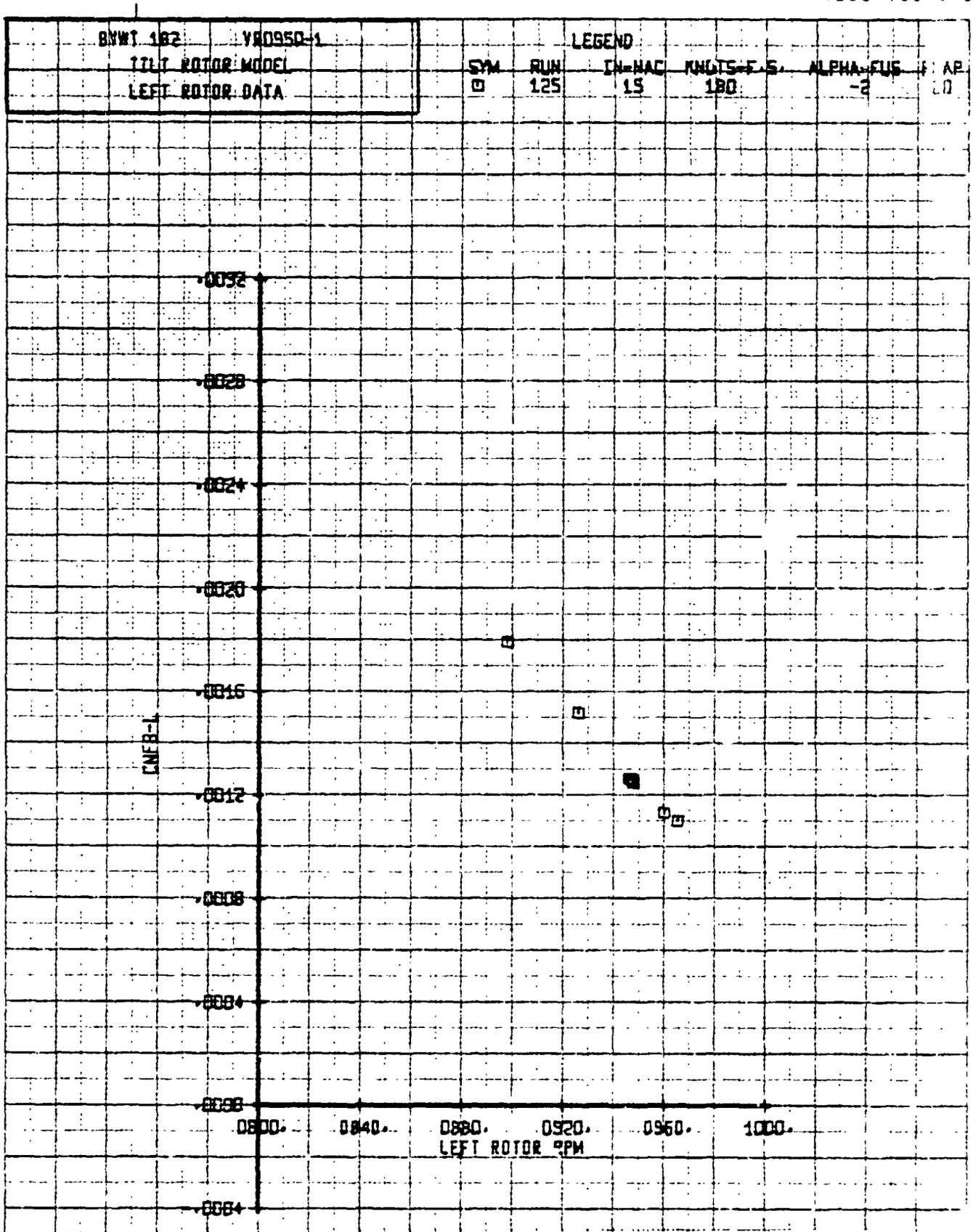


Figure 12-147. Left Rotor Normal Force Coefficient Versus Rotor F '. I_N = 15°. Full Scale Airspeed 180 Knots.

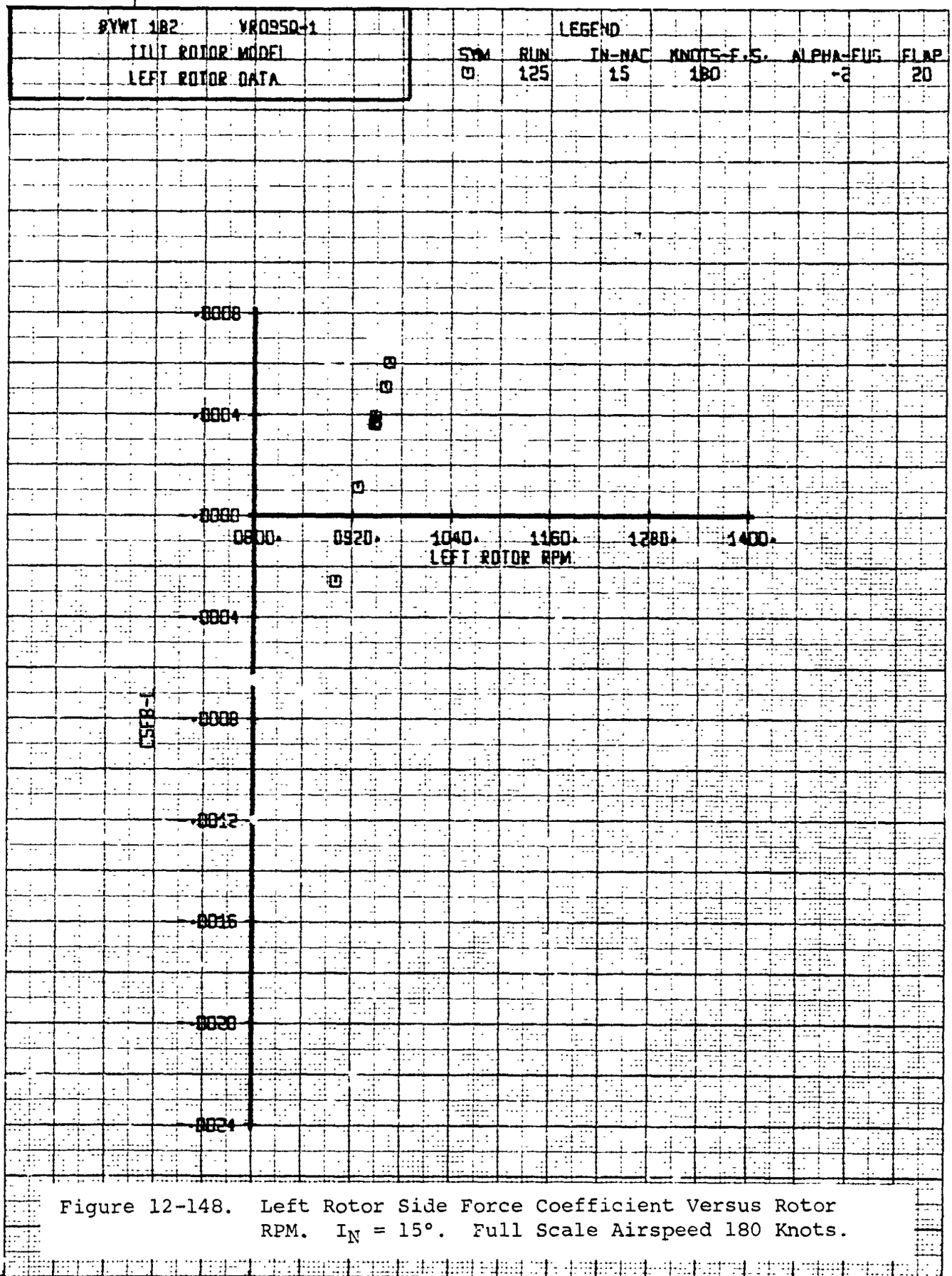


Figure 12-148. Left Rotor Side Force Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

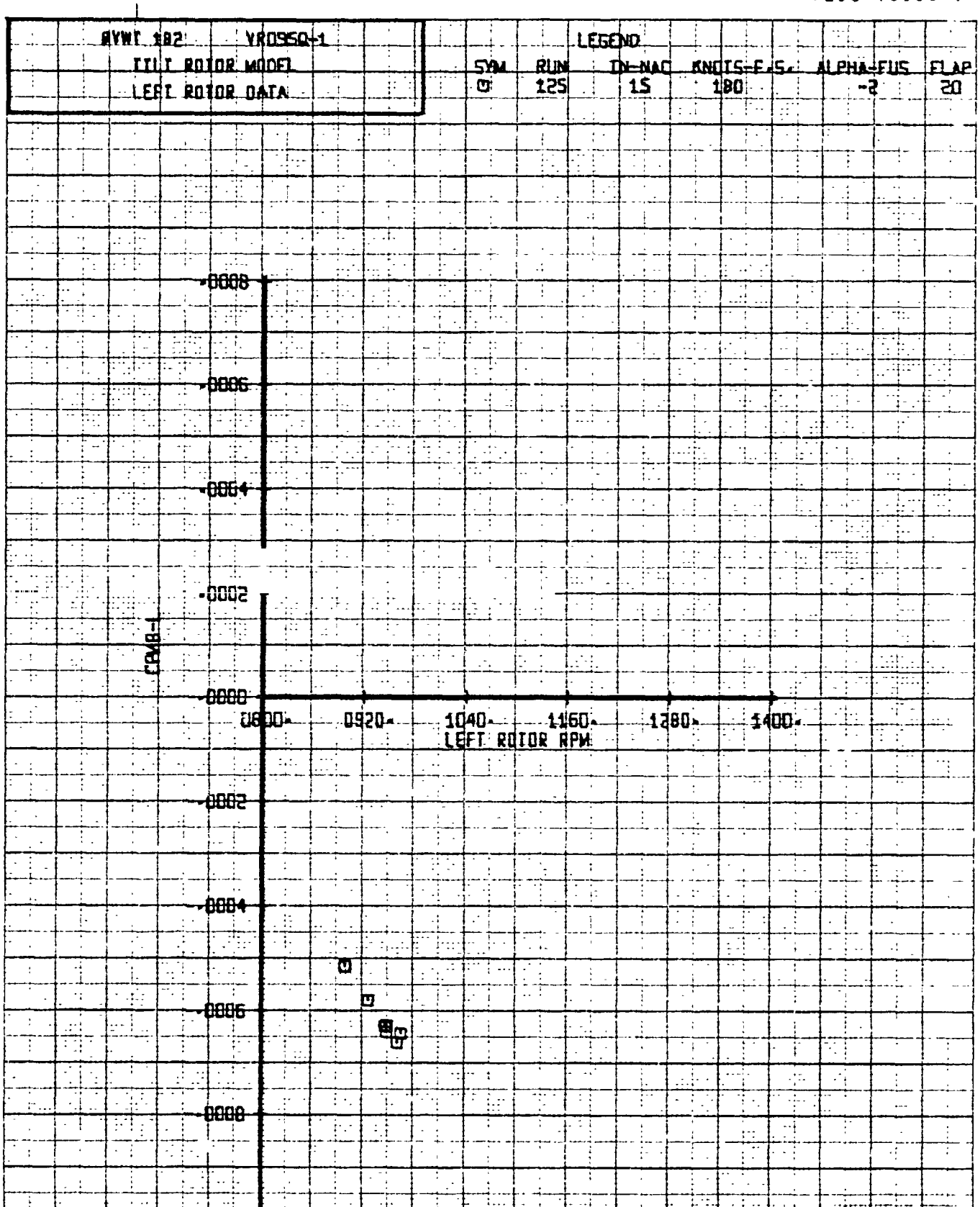
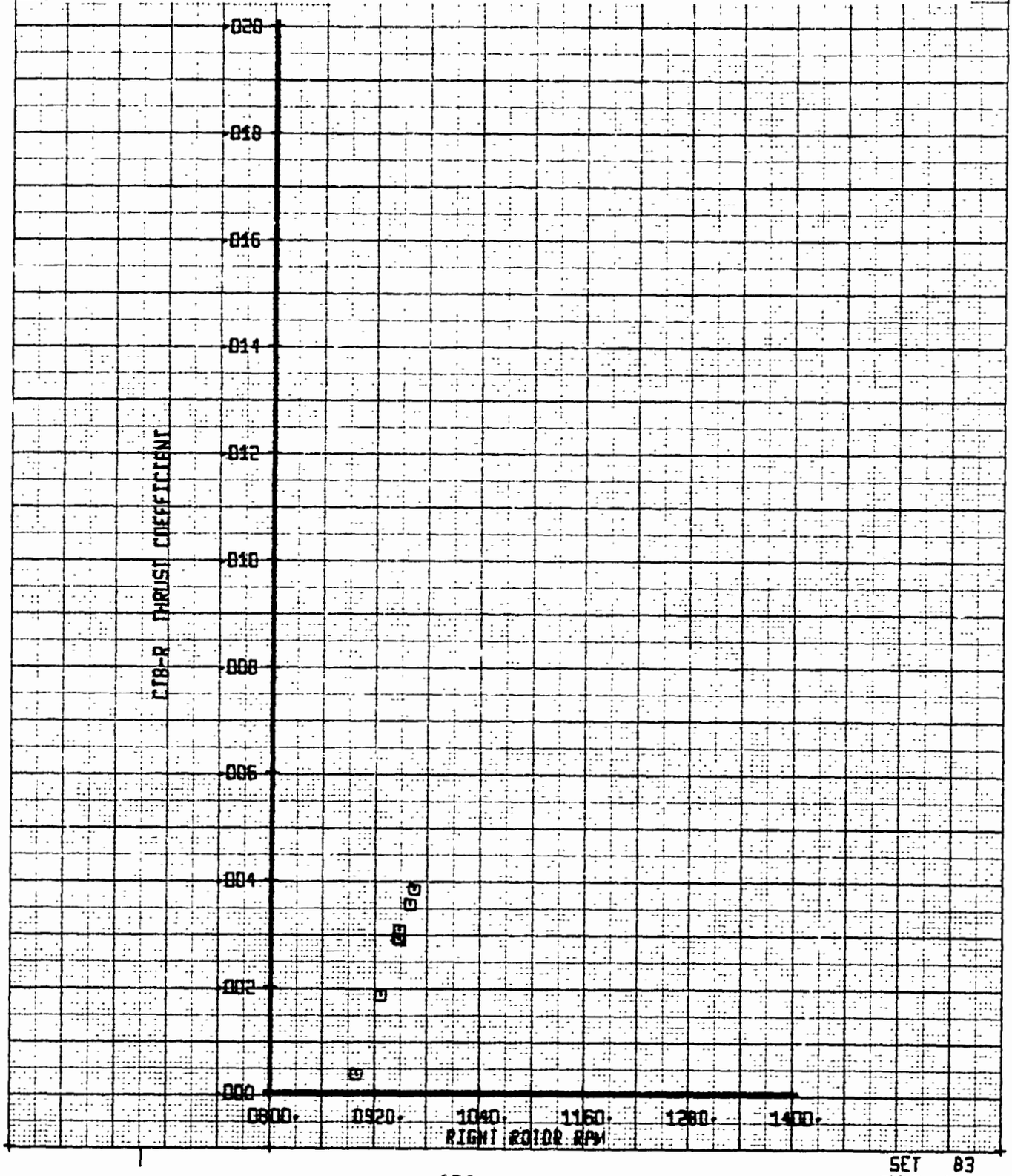


Figure 12-149. Left Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	125	15	180	-2	20

Figure 12-151. Right Rotor Thrust Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.



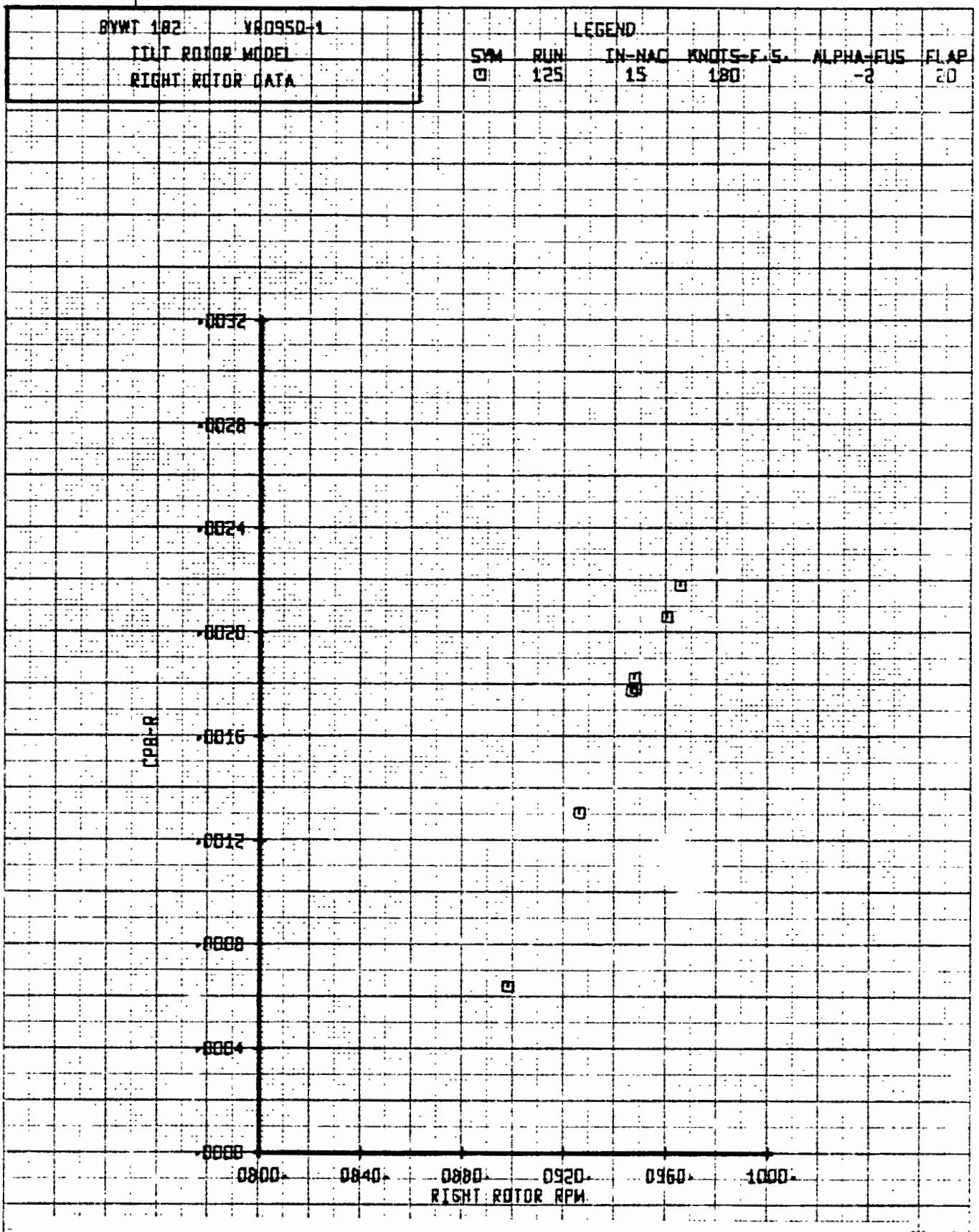


Figure 12-152. Right Rotor Power Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

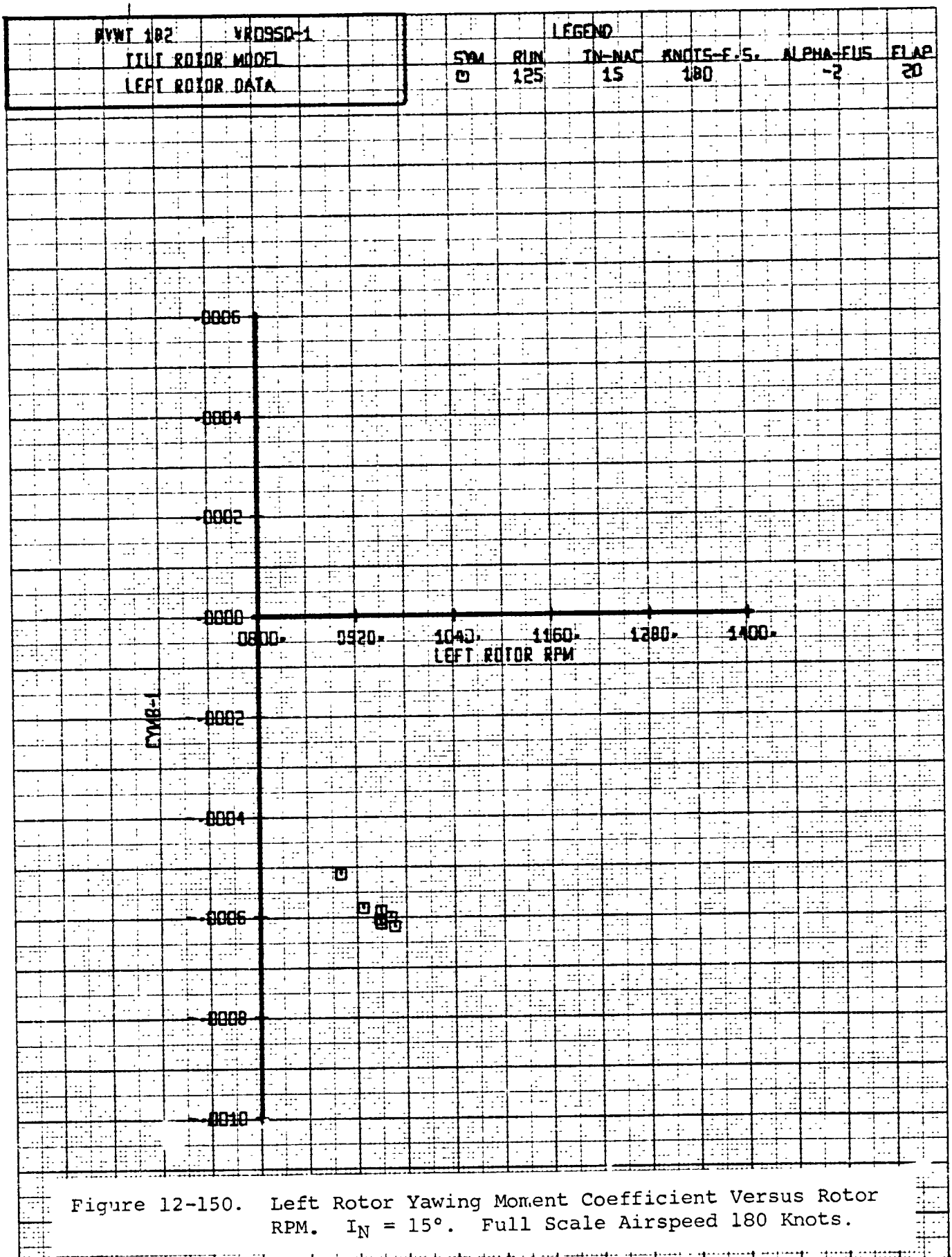


Figure 12-150. Left Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

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SET B3
BVWT 182

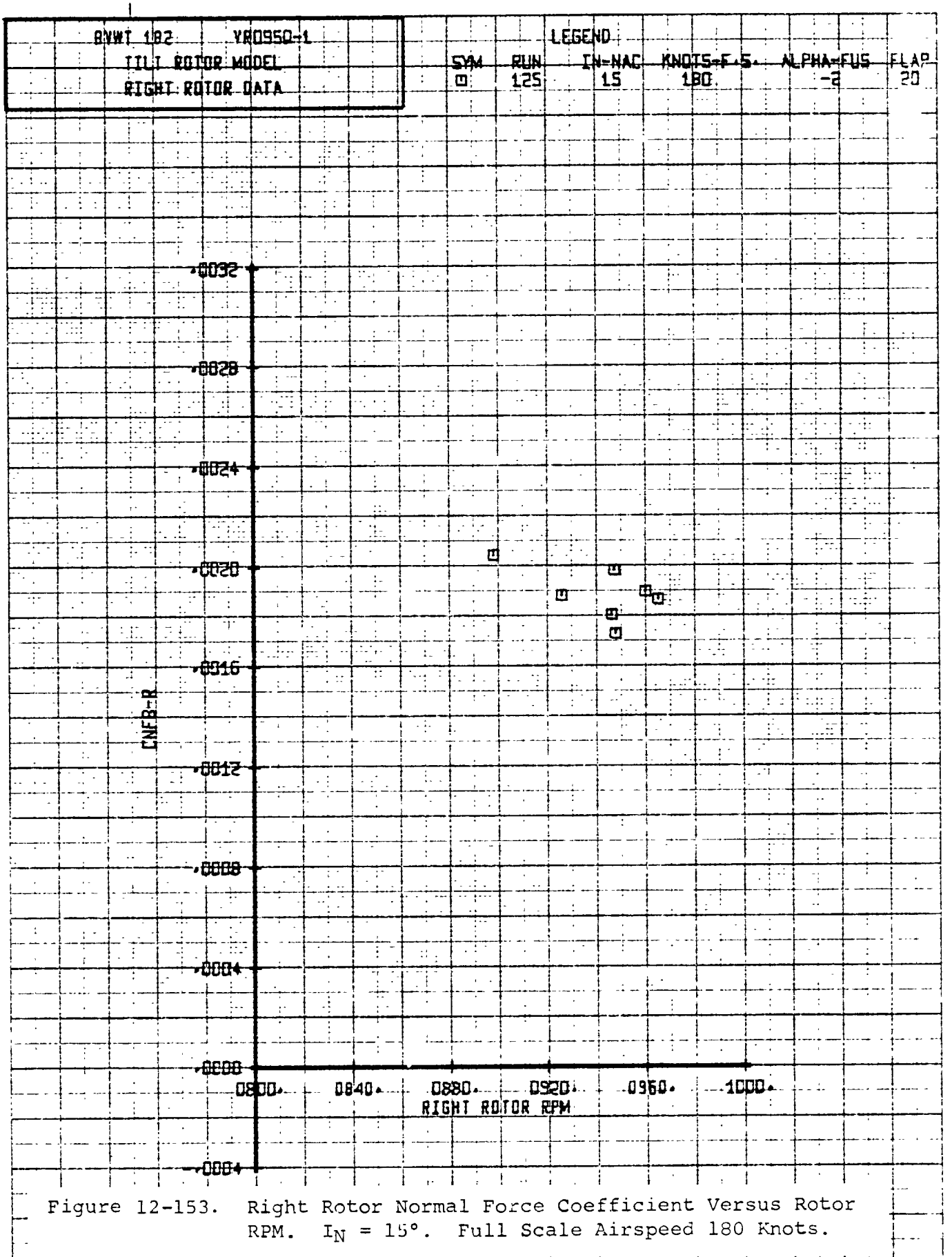


Figure 12-153. Right Rotor Normal Force Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

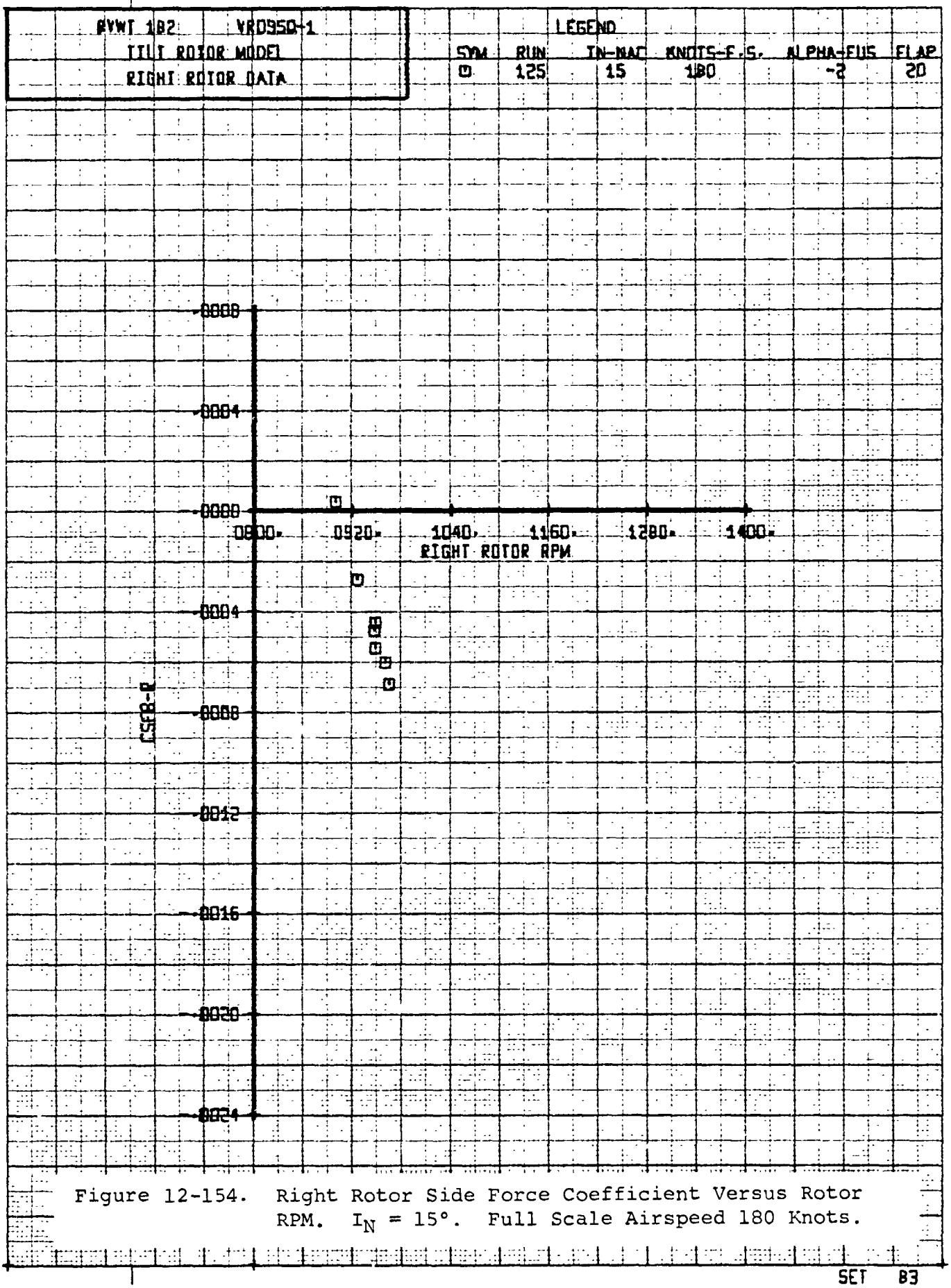


Figure 12-154. Right Rotor Side Force Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

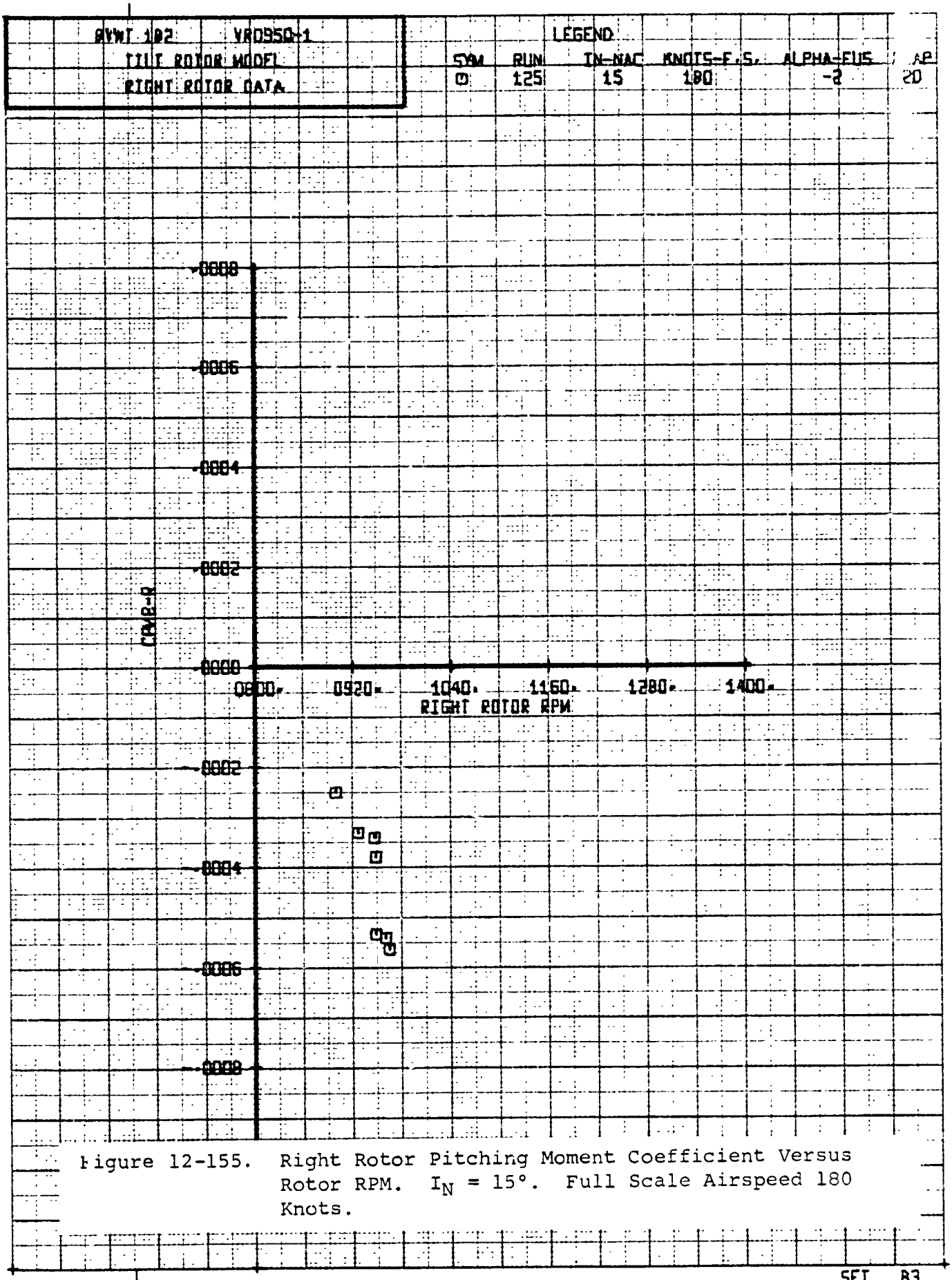


Figure 12-155. Right Rotor Pitching Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

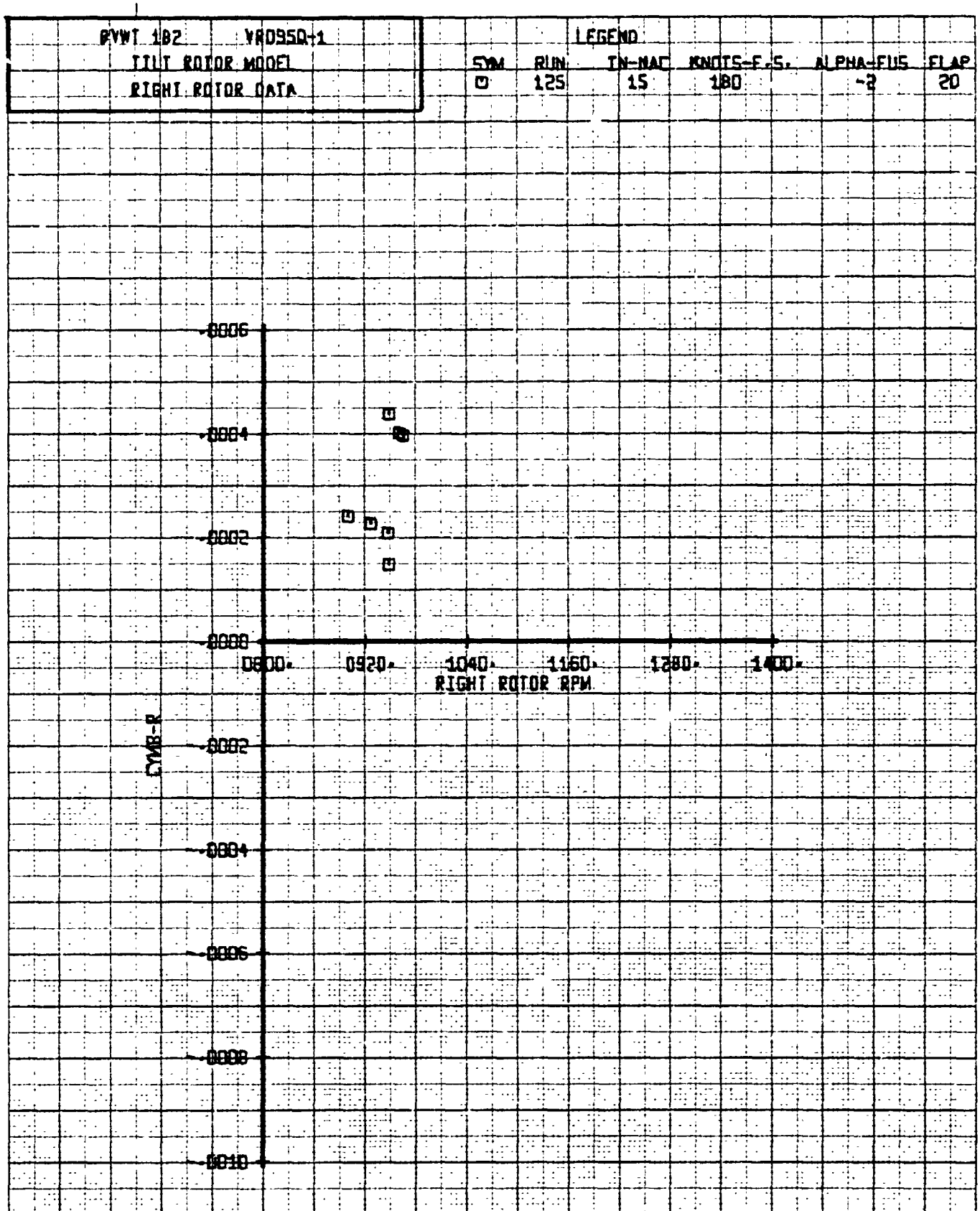
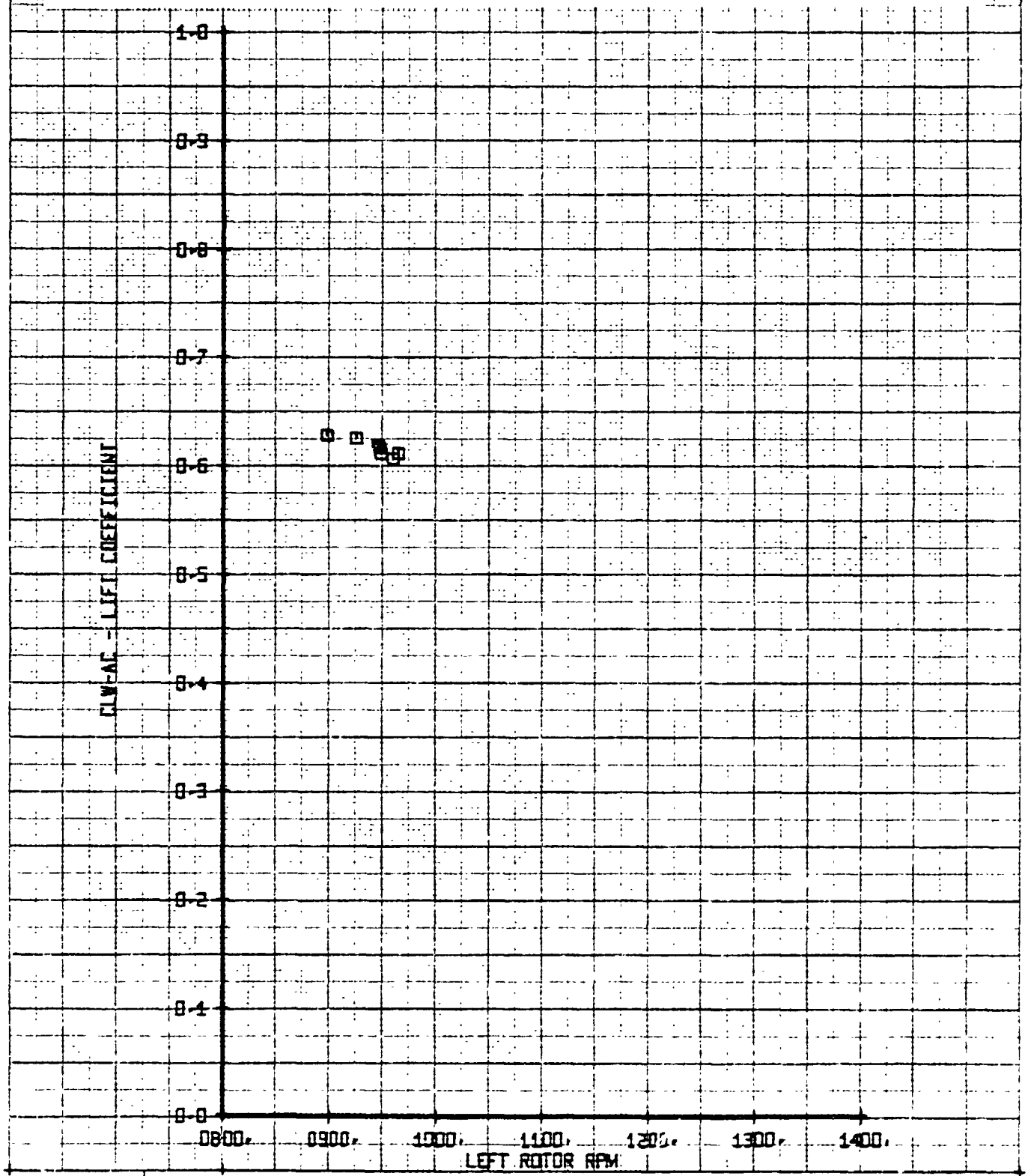


Figure 12-156. Right Rotor Yawing Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	125	15	180	-2	0

Figure 12-157. Aircraft Lift Coefficient Versus Rotor RPM.
I_N = 15°. Full Scale Airspeed 180 Knots.



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SET B3
BVWT 182

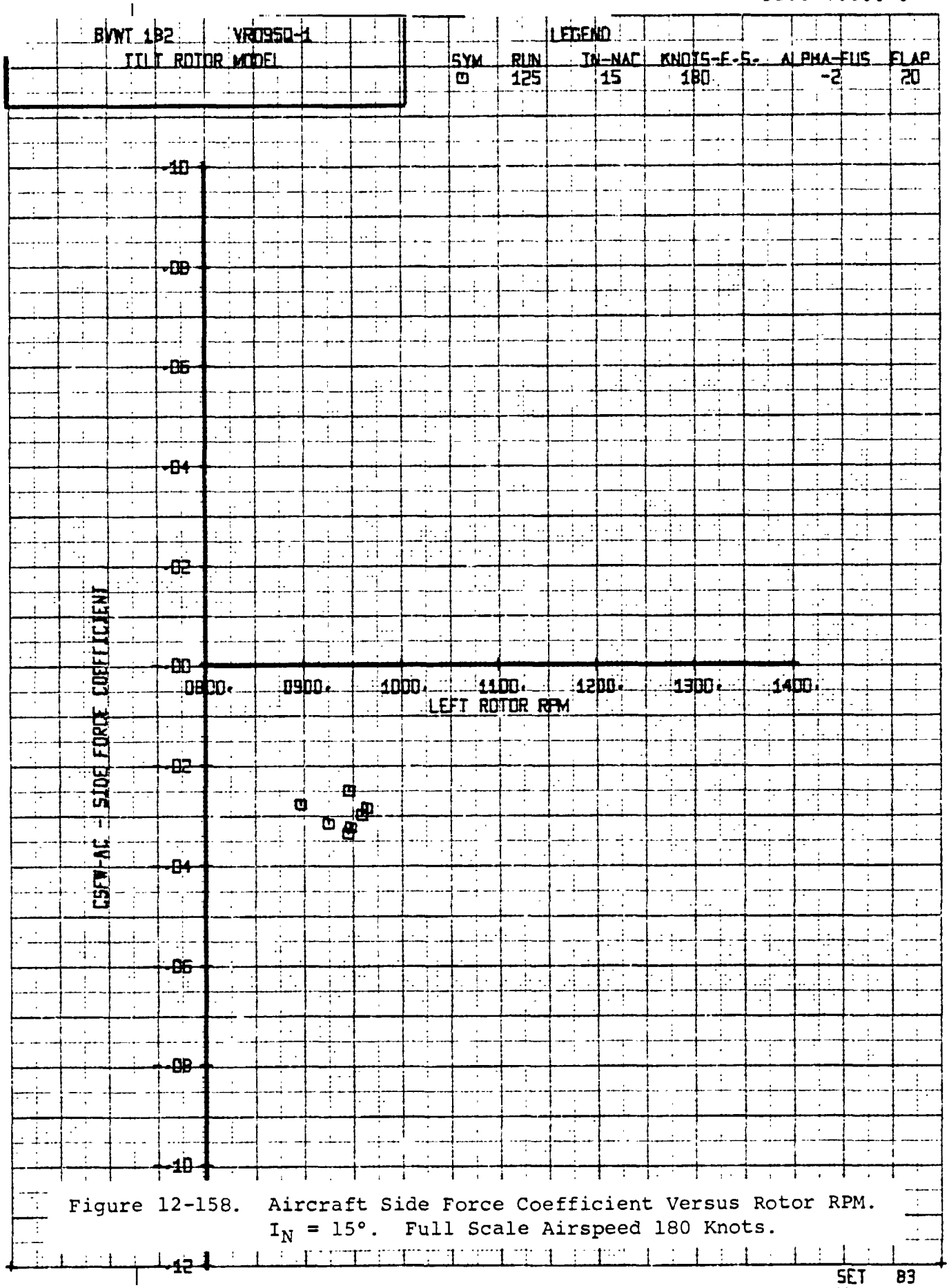

Figure 12-158. Aircraft Side Force Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

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SET B3
BVWT 182

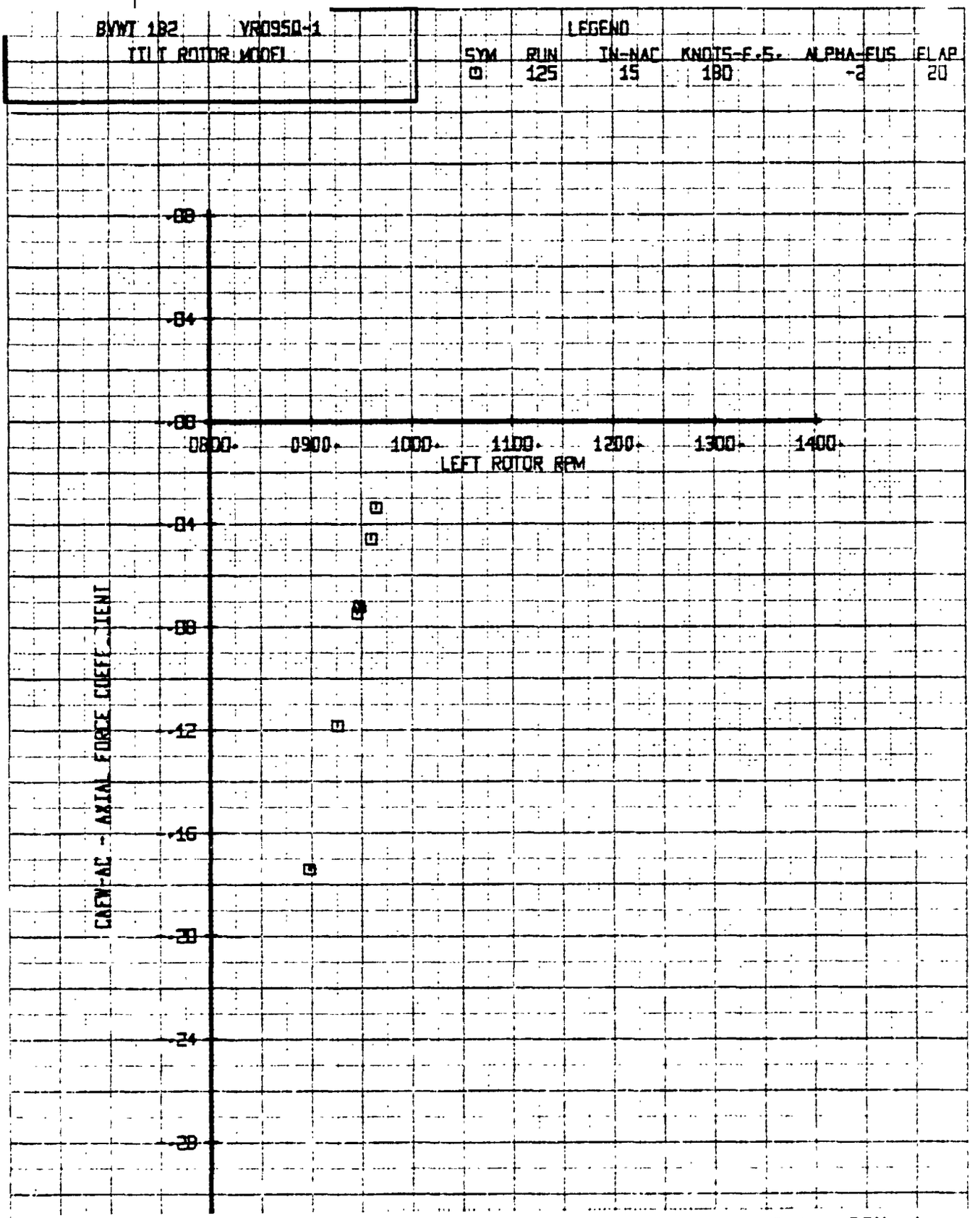

Figure 12-159. Aircraft Axial Force Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

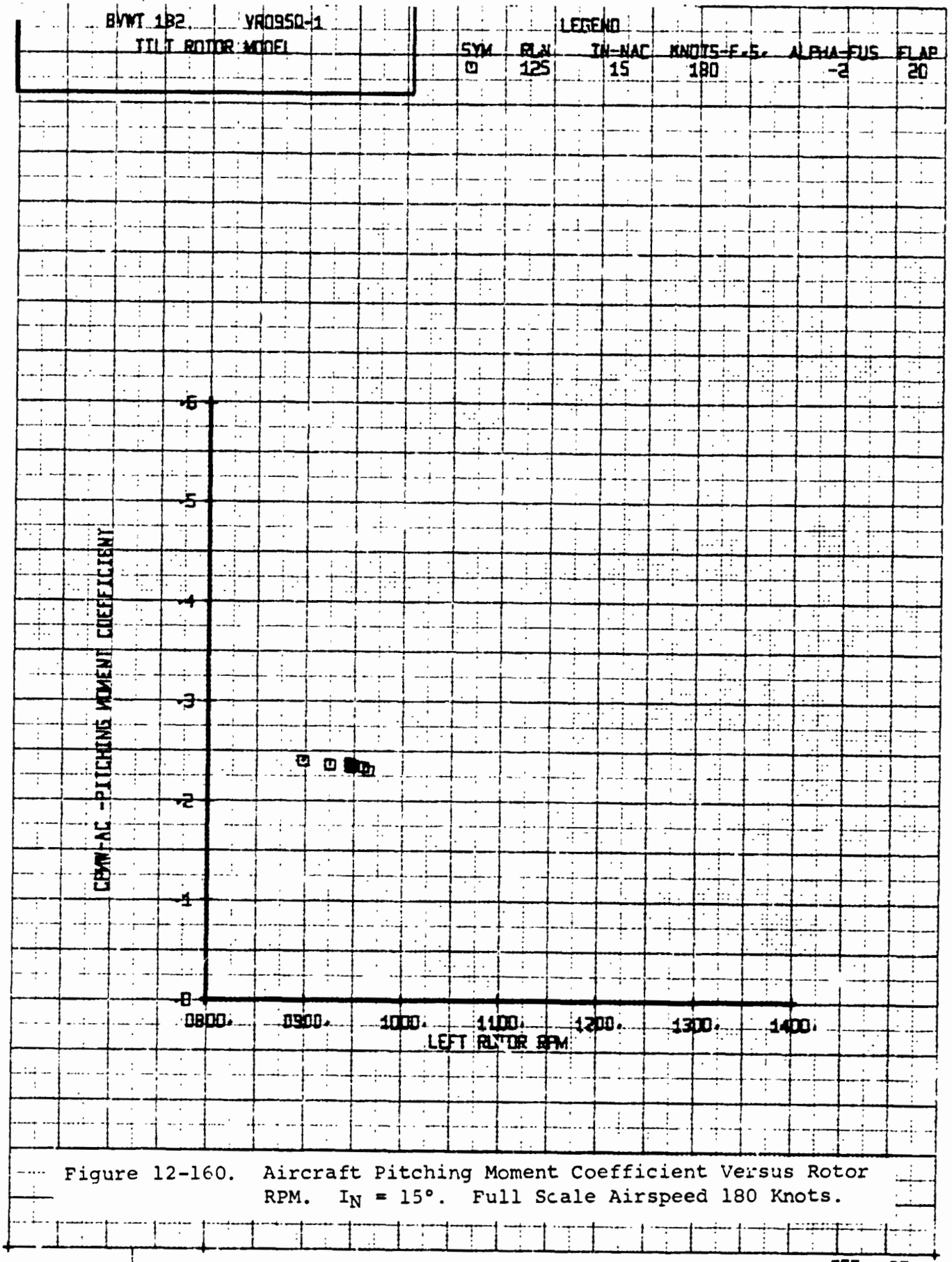

Figure 12-160. Aircraft Pitching Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

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SET B3
BVWT 182

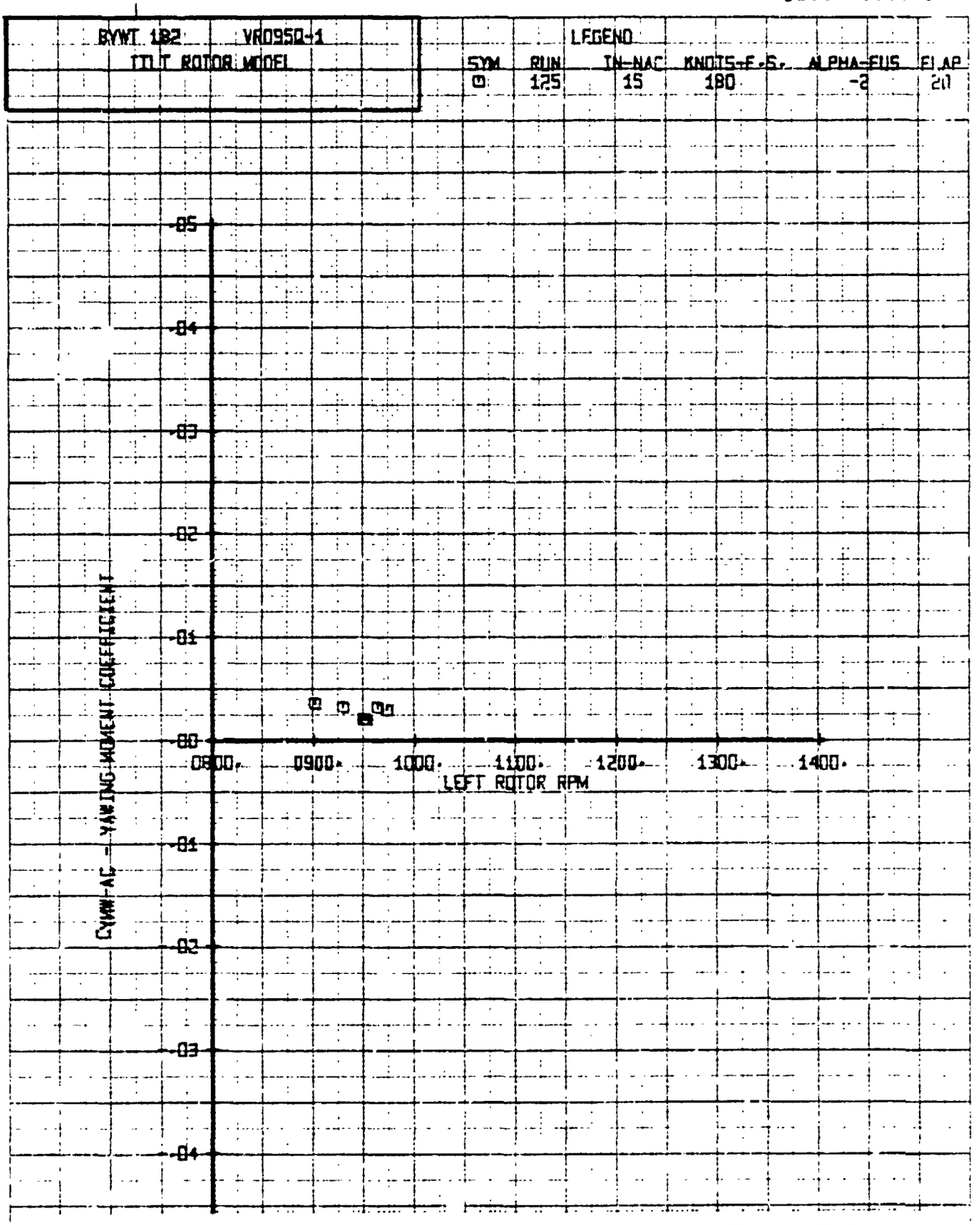


Figure 12-161. Aircraft Rolling Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

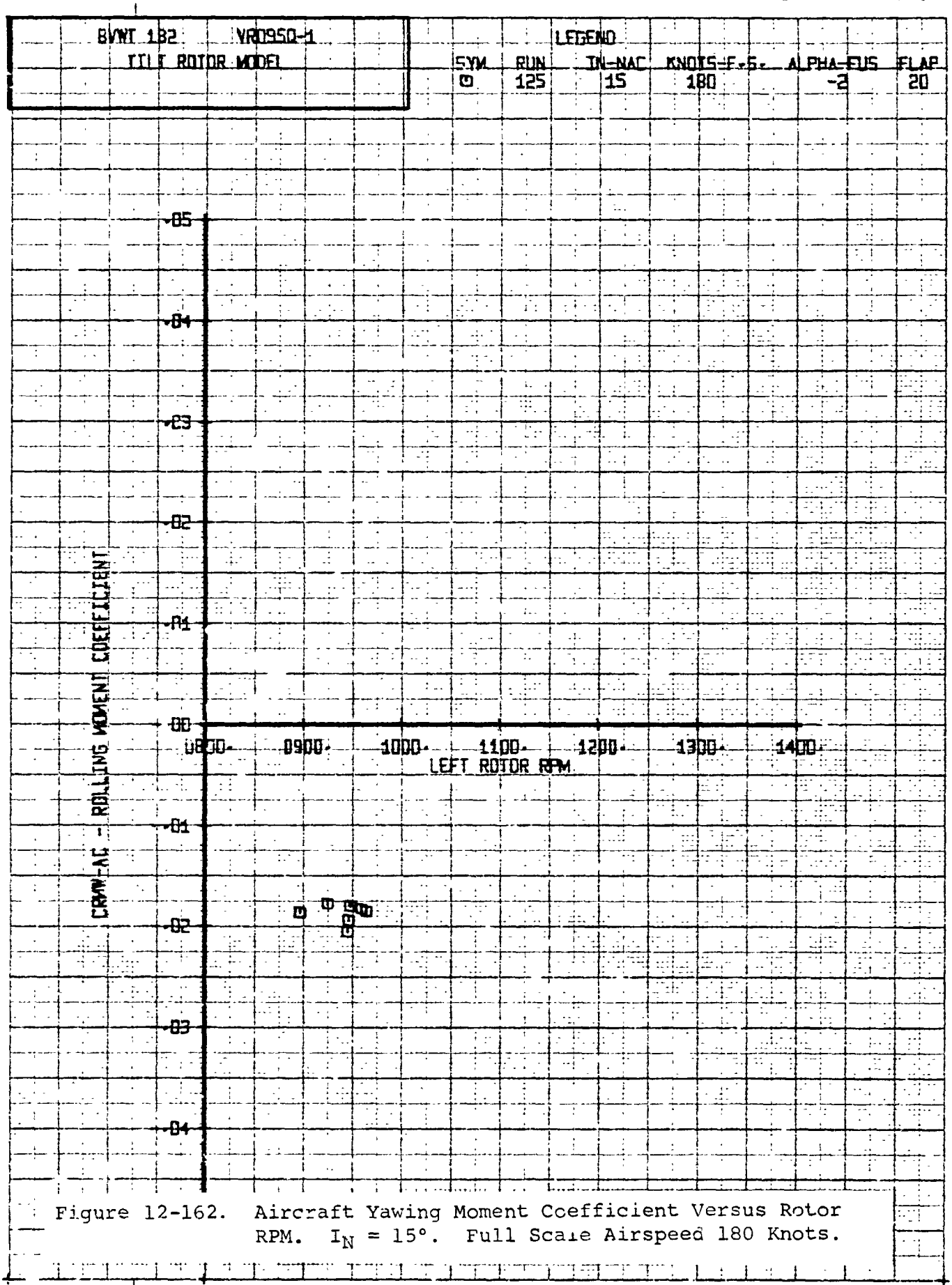


Figure 12-162. Aircraft Yawing Moment Coefficient Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

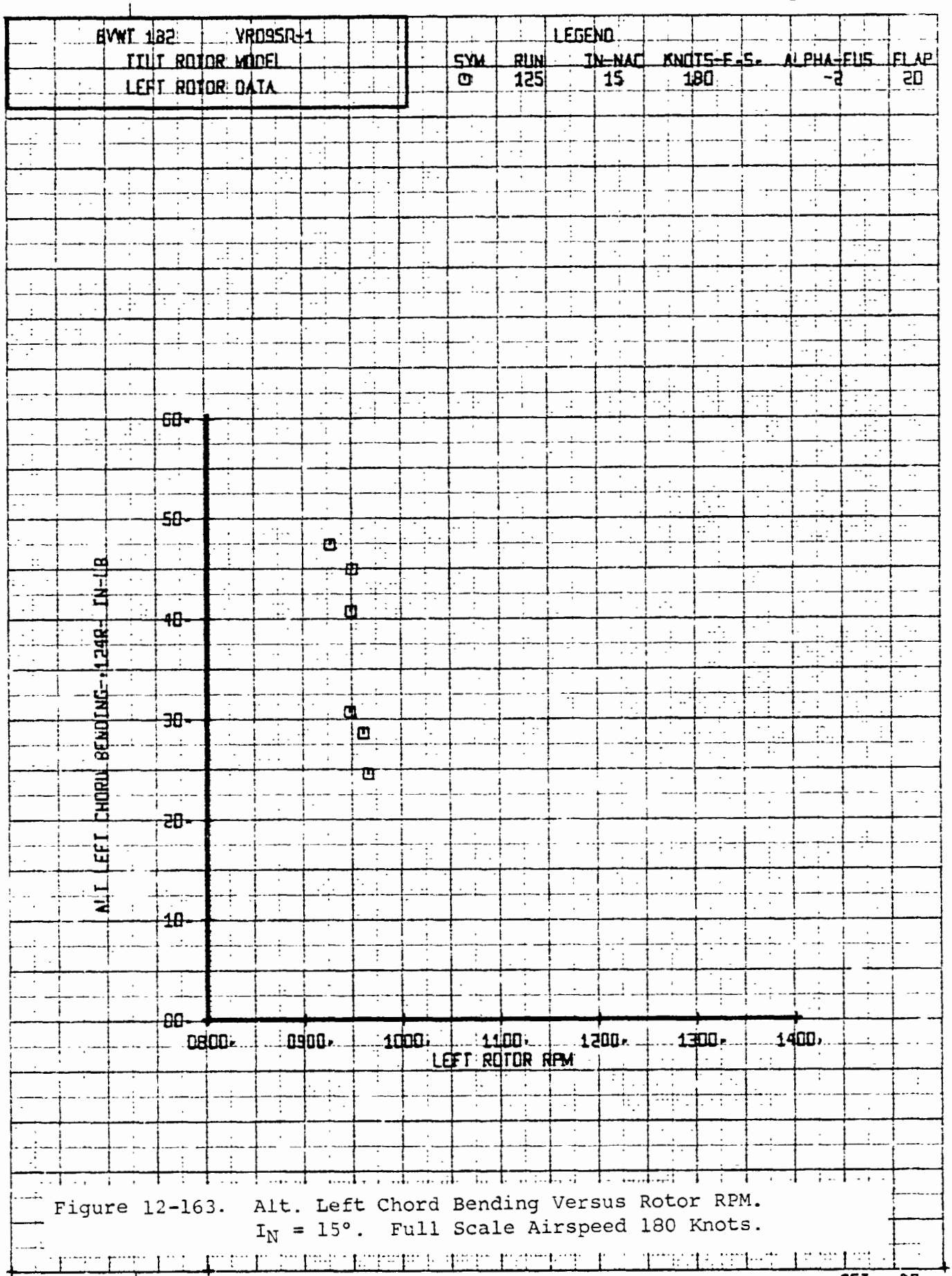
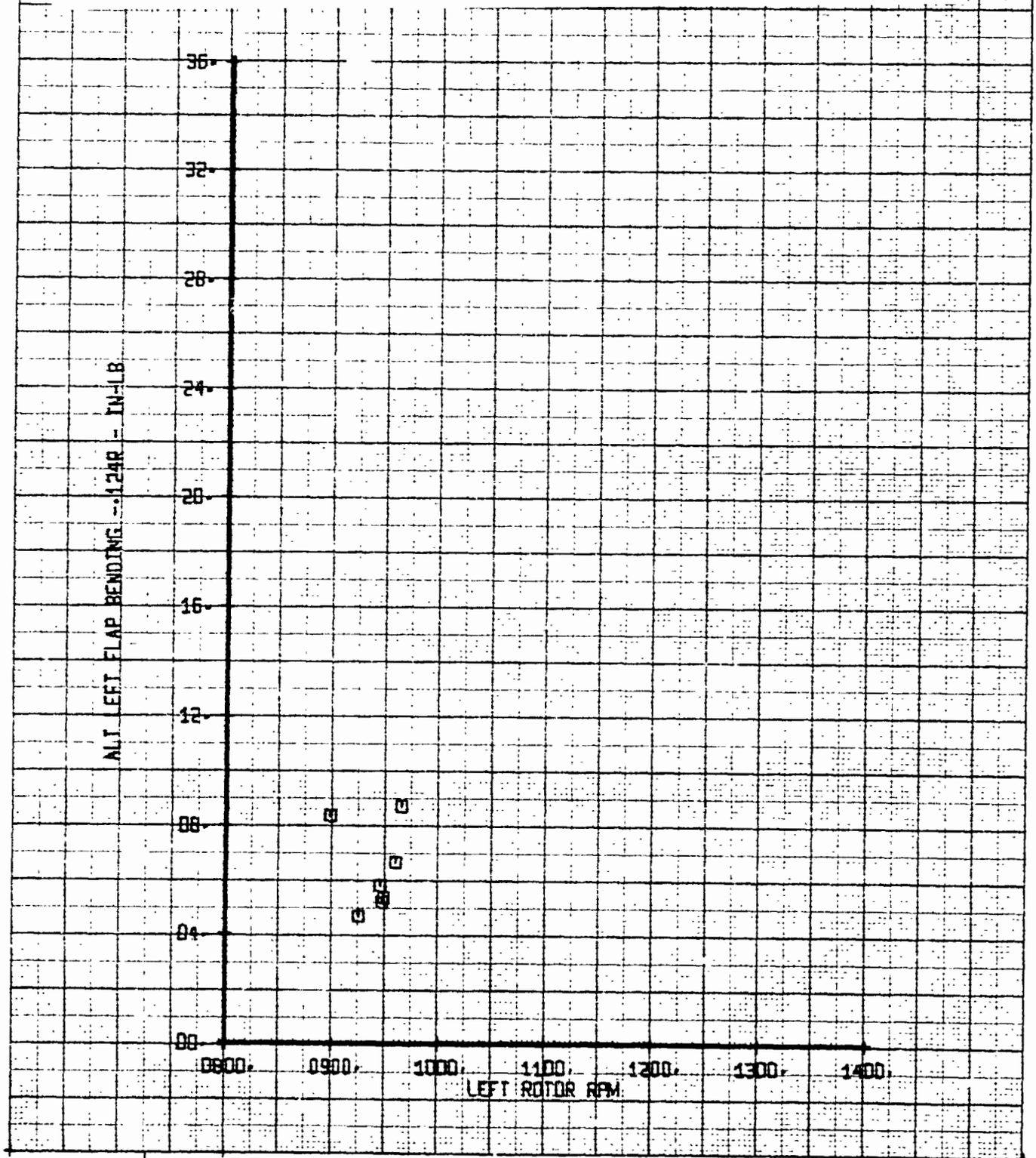


Figure 12-163. Alt. Left Chord Bending Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	125	15	180	-2	20

Figure 12-164. Alt. Left Flap Bending Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.



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SET 83
BVWT 182

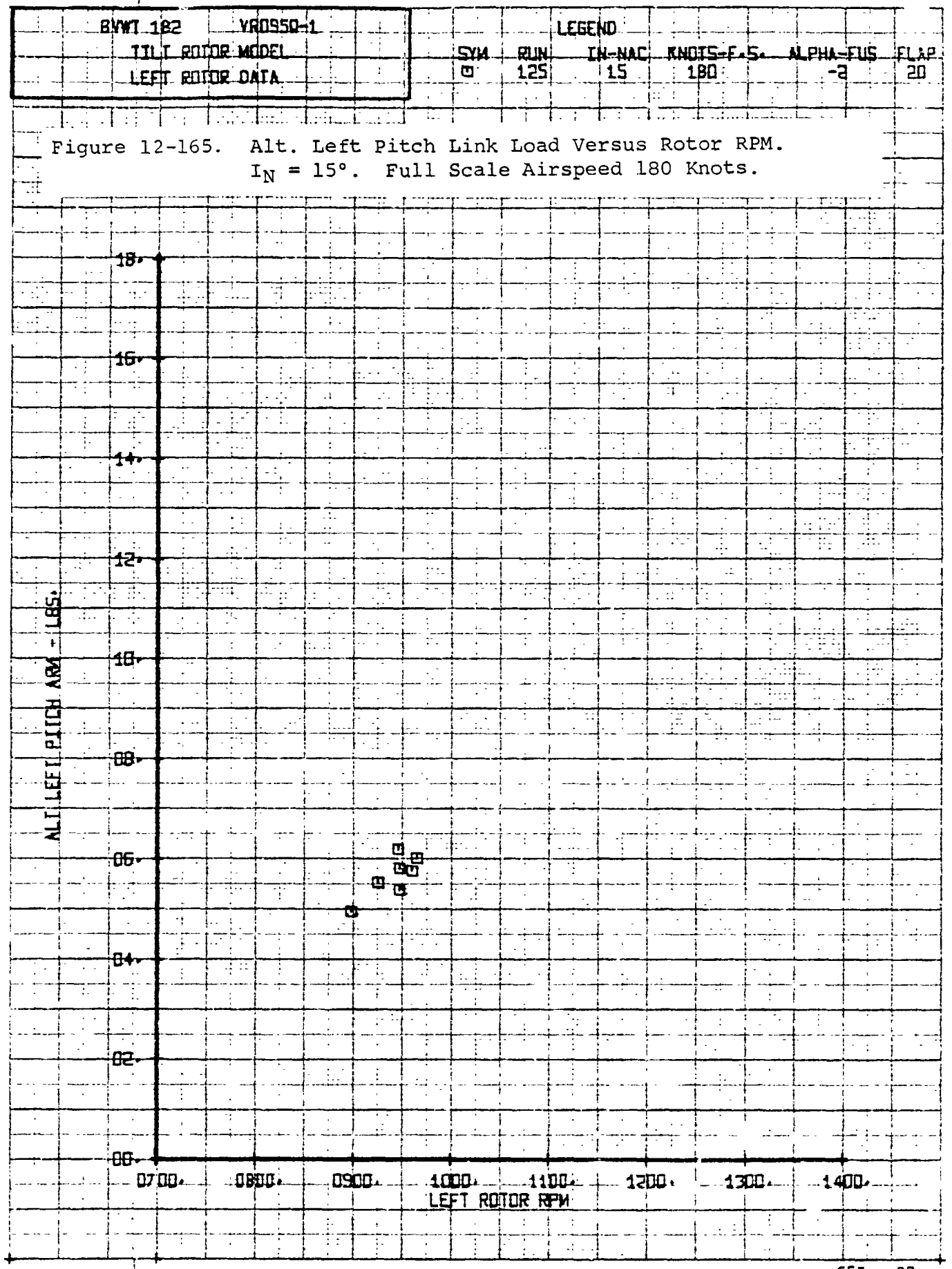


Figure 12-165. Alt. Left Pitch Link Load Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

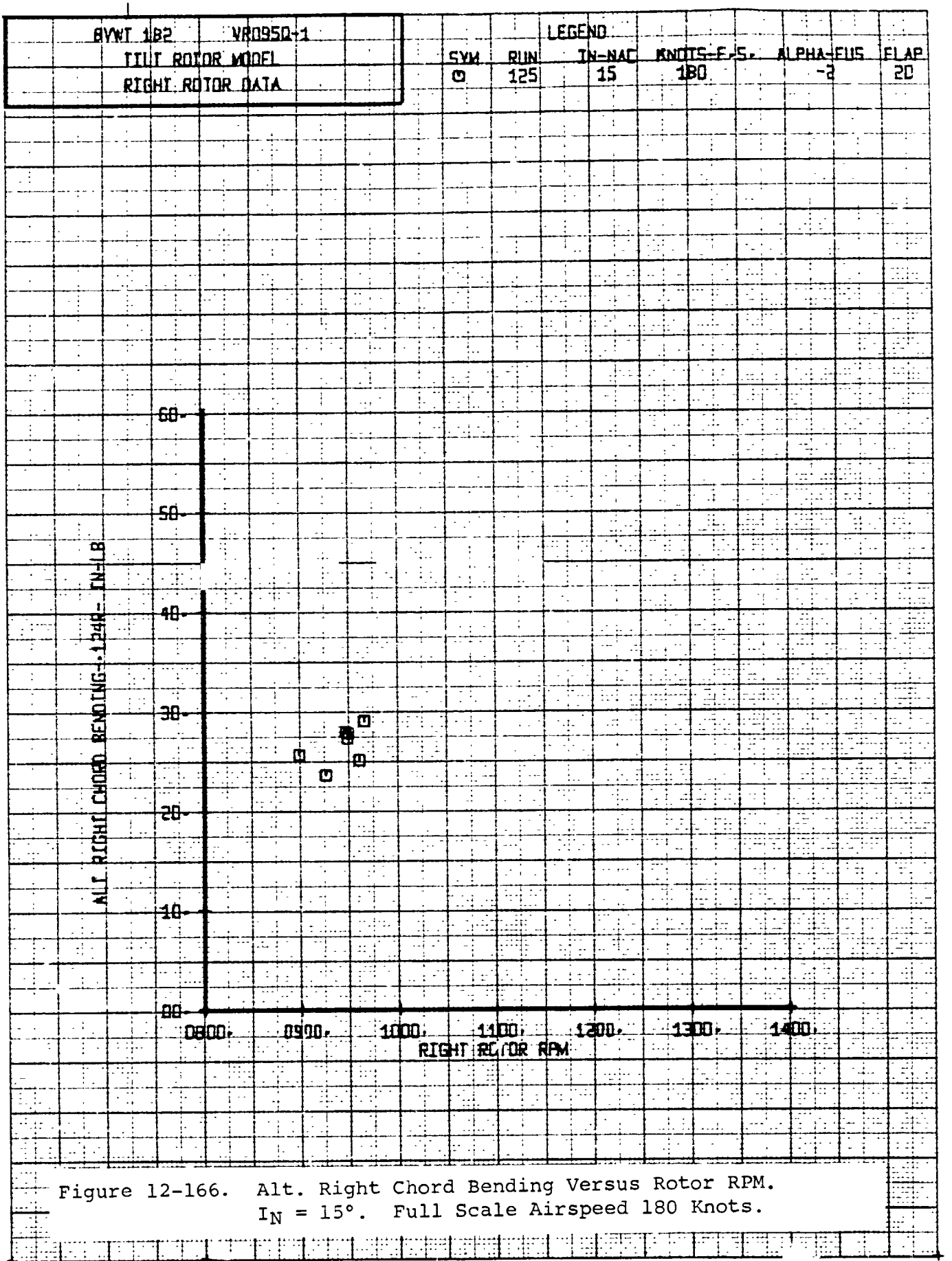


Figure 12-166. Alt. Right Chord Bending Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

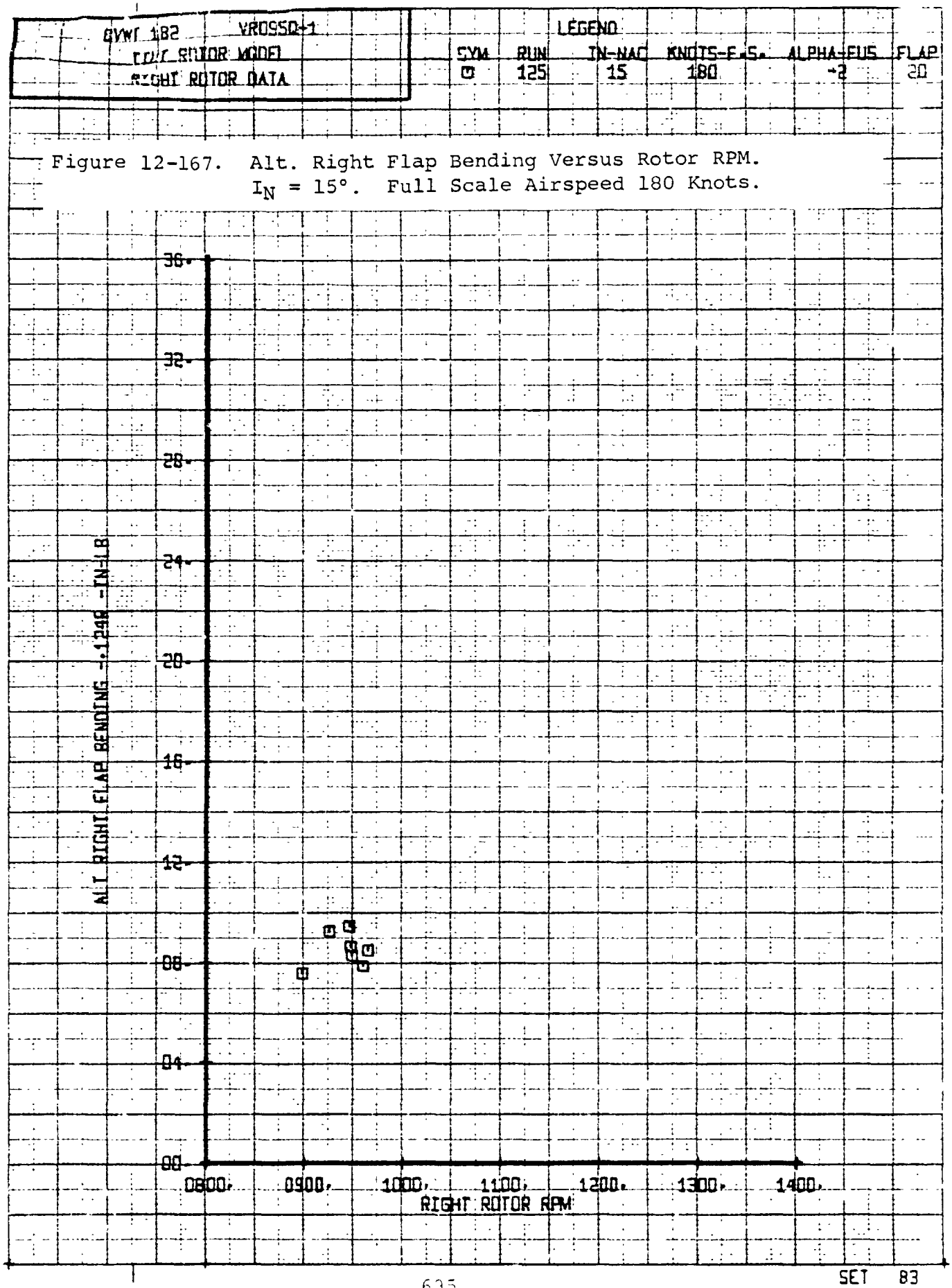
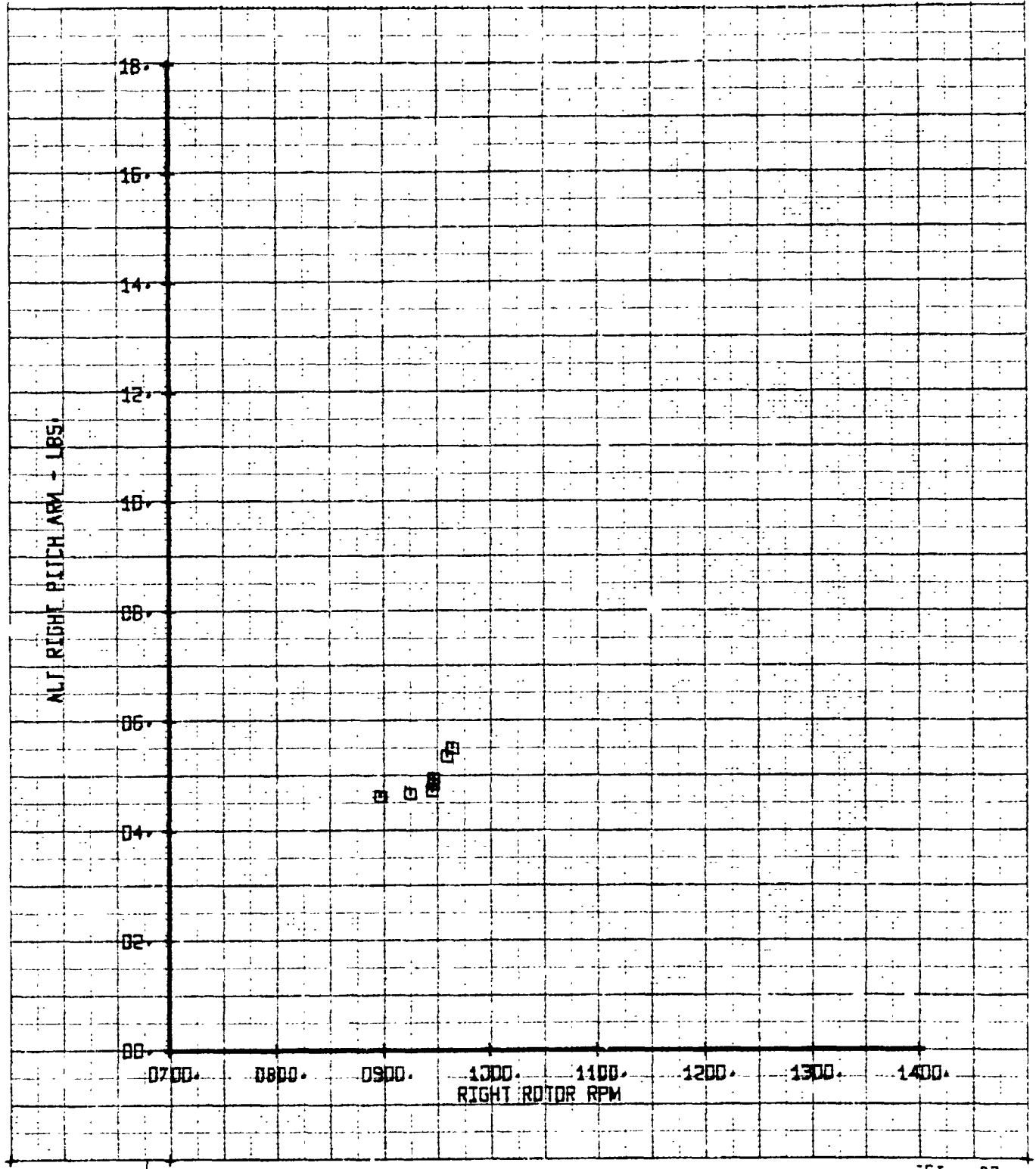


Figure 12-167. Alt. Right Flap Bending Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.

BVWT 182 YAO950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND					
SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-DEG	FLAP
⊡	125	15	180	-2	20

Figure 12-168. Alt. Right Pitch Link Load Versus Rotor RPM. I_N = 15°. Full Scale Airspeed 180 Knots.



B3
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SET B3
BVWT 182